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ABSTRACT

This volume presents various theoretical orientations and perspectives of the drug abuse research field, derived from the social and biomedical sciences. The first section contains a separate theoretical overview for each of the 43 theories or perspectives. The second section contains five chapters which correspond to the five components of a drug abuse theory, i.e., initiation, continuation, transition and use to abuse, cessation, and relapse. A series of guides, devised to facilitate comparison and contrast of the theories, lists: (1) all contributing theorists and their professional affiliations: (2) classifications of the theories into four categories of one's relationship to self, to others, to society, and to nature: (3) identifications of the theories by academic discipline: (4) corresponding page numbers for each theory and its overview: and (5) a concise, comparative summary of each theory. Suggestions for the use of this reference are also included. (Author/NRB)

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THEORIES ON DRUG ABUSE

Selected Contemporary Perspectives

Editors:

DAN J. LETTIERI, Ph.D.

MOLLIE SAYERS

HELEN WALLENSTEIN PEARSON

NIDA Research Monograph 30

March 1980

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National Institute on Drug Abuse
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THEORIES ON DRUG ABUSE

Selected Contemporary Perspectives

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Foreword

One of the more striking aspects of drug research over the last few years is the relative upsurge of various models and theories explaining, wholly or in part, the problems of drug abuse. In fact, this rapid growth has signaled the need for a single, concise, and widely available volume which would allow interested researchers to discover the existence, diversity, convergence, and complexity of the array of contemporary explanatory perspectives.

Undertaking the preparation of such a compendium was carefully considered. It was our intent to present as many theories as practicable, in an open, nonjudgmental, noncritical manner, and to allow each theorist to speak for his or her own theory. The volume contains 43 theoretical perspectives representing the work of more than 50 theorists. I trust the reader will find this collection of ideas stimulating and will be encouraged to generate future research aimed at hypothesis and theory testing.

Marvin Snyder, Ph.D.
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A Guide to the Volume

One of the early indications that a social problem research domain has come of age is the quantity and quality of the theoretical explanations for it. Over the last several years interest in research on the problems of drug dependence has grown dramatically. What is particularly striking is that each of a wide array of scientific disciplines has explored the problem. Drug dependence is a complex contemporary social problem. Its complexity derives in part from the impact it has on the individual user psychologically, socially, and biologically, and in part from its effects on society, law, economics, and politics.

The primary intent of this volume is to present a representative selection of contemporary theoretical orientations and perspectives in the drug abuse research field, derived from the social and biomedical sciences. Among our secondary aims and intents were these: (1) to produce a major reference volume for research scientists and other interested readers, (2) to afford theorists a forum in which to present their views, and (3) to allow readers to compare and contrast the diverse range of theories on drug abuse.

In designing this volume, it was necessary to assure that each contributing theorist would have sufficient latitude in style of presentation and textual development, and yet that the reader would find comparable discussions of formalized issues so that convergences and divergences among and between the theories could be easily discerned. The solution to these apparently disparate aims was to divide the volume into two distinct parts. Part 1 of the volume contains 43 separate theoretical overviews, one for each of the theories or perspectives. Here, the contributors were given relatively free rein to present an overview of their positions. In contrast, the second part of the volume is purposefully highly structured.

For practical purposes we needed a working definition for theories. The question became, "What is a theory of drug use/abuse, and what are its components?" In general we viewed a theory as something which addressed at least several of the following topics: (1) why people begin taking drugs, (2) why people maintain their drug-taking behaviors, (3) how or why drug-taking behavior escalates to abuse, (4) why or how people stop taking drugs, and (5) what accounts for the restarting of the drug dependence behavior or cycle once stopped. The five chapters of part 2 refer to these five components of a theory, namely, Initiation, Continuation, Transition: Use to Abuse, Cessation, and Relapse. It was hoped that such an organizational framework would facilitate the reader's ability to compare and contrast the theories.

In order to facilitate cross-theory comparisons even further, a series of guides has been included in the volume. Additionally, we developed, in conjunction with the authors, a set of shorthand or abbreviated theory titles. Guide 1 is a listing of all contributing theorists and their affiliations. The second guide is a classification of the theories into four broad categories, theories on one's relationship to self, to others, to society, and to nature. A more specific classification of the theories by academic discipline appears in guide 3.

The most important of the guides is guide 4, Organization of the Volume. For each theory, this guide gives the pages on which the overview can be found in part 1, and the page numbers of the corresponding theoretical components (if any) in part 2.

Guide 5, Theory Boundaries, presents a concise, comparative summary of each theory, including its drug focus; the age, sex, and ethnicity of the population to which the theory applies; and a listing of the key variables inherent in the theory.

There are several ways to use this reference volume. One could of course read it straight through. One could read a particular theory overview in part 1 immediately followed by the corresponding sections or components in part 2. Or one may wish to focus on a specific theoretical component of interest in part 2 followed by selective reading of appropriate overview material in part 1. We hope that the volume's specialized format will encourage and facilitate its frequent use.

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GUIDE 2.—*Theory classification*

Theorists	Abbreviated titles	Self	Others	Society	Nature
Ausubel	Personality-Deficiency Theory	●			
Becker	Social Influence Theory			●	
Bejerot	Addiction-to-Pleasure Theory				●
Chein	Disruptive Environment Theory		●		
Coleman	Incomplete Mourning Theory		●		
Cole and Nyswander	Metabolic Deficiency Perspective				●
Frederick	Learned Behavior Theory			●	
Gold	Cognitive Control Theory	●			
Goodwin	Bad-Habit Theory	●			
Gorsuch	Multiple Models Theory	●			
Greaves	Existential Theory	●			
Hendin[1]	Adaptational Theory			●	
Hill	Social Deviance Theory		●		

Theory classification was in the main chosen by the authors and reflects the authors' first choice of category. It is recognized that many of these theories could be classified in more than one category.--ED.

[1] The choosing of this classification was somewhat arbitrary; other classifications would also have been appropriate.

GUIDE 2.—*Theory classification—Continued*

Theorists	Abbreviated titles	Self	Others	Society	Nature
Hochhauser	Biological Rhythm Theory				●
Huba, Wingard, and Bentler[1]	Interactive Framework		●		
Jessor and Jessor	Problem Behavior Theory		●		
Johnson	Drug Subcultures Theory		●		
Jonas and Jonas[1]	Bioanthropological Theory				●
Kandel	Developmental Stages Theory		●		
Kaplan[1]	Self-Derogation Theory		●		
Khantzian	Ego/Self Theory	●			
Lindesmith	General Addiction Theory	●			
Loney	Hyperactive Adolescents Theory		●		
Lukoff	Sociological Theory			●	
Martin	Neuropharmacologic Theory				●
McAuliffe and Gordon[1]	Combination-of-Effects Theory		●		
Milkman and Frosch	Coping Theory	●			
Misra	Achievement-Anxiety Theory			●	

The choosing of this classification was somewhat arbitrary; other classifications would also have been appropriate.

GUIDE 2.—*Theory classification—Continued*

Theorists	Abbreviated titles	Self	Others	Society	Nature
Peele	Addictive Experiences Theory		●		
Prescott	Social Neurobiological Theory				●
Robins	Natural History Perspective			●	
Schuckit	Genetic Theory				●
Simon	Opiate Receptor Perspective				●
Smart[1]	Availability and Proneness Theory	●			
Smith[1]	Perceived Effects Theory	●			
Spotts and Shontz	Life-Theme Theory	●			
Stanton	Family Theory		●		
Steffenhagen	Self-Esteem Theory		●		
van Dijk	Cyclical Process Theory		●		
Wikler	Conditioning Theory		●		
Winick	Role Theory			●	
Wurmser	Defense-Structure Theory	●			
Zinberg	Social Control Theory			●	

[1] The choosing of this classification was somewhat arbitrary; other classifications would also have been appropriate.

GUIDE 3.—*Disciplinary foci of the theories*

Theorists	Abbreviated titles	Psychiatry	Psychology--general	Psychology--learning	Social psychology	Developmental psychology	Sociology	Criminology	Anthropology	Biology	Genetics	Biomedical sciences	Neurosciences	Other
Ausubel	Personality-Deficiency Theory	P				S								
Becker	Social Influence Theory				S		P							
Bejerot	Addiction-to-Pleasure Theory									P				
Chein	Disruptive Environment Theory				P		S	S	S					
Coleman	Incomplete Mourning Theory	S		S	P	P								
Dole and Nyswander	Metabolic Deficiency Perspective												P	
Frederick	Learned Behavior Theory	S		P										
Gold	Cognitive Control Theory		P	S										
Goodwin	Bad-Habit Theory			P							S			
Gorsuch	Multiple Models Theory		P	S	S	S								
Greaves	Existential Theory	P												Clinical Psychol. (P)
Hendin	Adaptational Theory	P	S		S	S	S							Psychoanalysis (P)

P--Primary
S--Secondary

GUIDE 3.—*Disciplinary foci of the theories—Continued*

Theorists	Abbreviated titles	Psychiatry	Psychology—general	Psychology—learning	Social psychology	Developmental psychology	Sociology	Criminology	Anthropology	Biology	Genetics	Biomedical sciences	Neurosciences	Other
l	Social Deviance Theory			P	S			S						
chhauser	Biological Rhythm Theory			S								P		
ba, Wingard, and Bentler	Interactive Framework		S		P									
ssor and Jessor	Problem Behavior Theory				P	P	S	S						
nnson	Drug Subcultures Theory				S		P	S						
nas and Jonas	Bioanthropological Theory	S							P					
ndel	Developmental Stages Theory					P								Epidemiology (P)
plan	Self-Derogation Theory				P		S							
antzian	Ego/Self Theory	S				S								Psychoanalysis (P)
desmith	General Addiction Theory			S	P		S							
ney	Hyperactive Adolescents Theory	P												Multivariate Psychol. (P)

-Primary
-Secondary

GUIDE 3.—*Disciplinary foci of the theories—Continued*

Theorists	Abbreviated titles	Psychiatry	Psychology--general	Psychology--learning	Social psychology	Developmental psychology	Sociology	Criminology	Anthropology	Biology	Genetics	Biomedical sciences	Neurosciences	Other
Lukoff	Sociological Perspective						P	S						
Martin	Neuropharmacologic Theory											S	P	
McAuliffe and Gordon	Combination-of-Effects Theory			S	P									
Milkman and Frosch	Coping Theory	S				P								
Misra	Achievement-Anxiety Theory		P				S							
Peele	Addictive Experiences Theory				P									
Prescott	Social Neurobiological Theory				S	S	S	S	S	S			P	*(P)
Robins	Natural History Perspective	P					P							
Schuckit	Genetic Theory	P	S				S	S	S		P	S	S	
Simon	Opiate Receptor Perspective	S										P	P	
Smart	Availability and Proneness Theory		P					S						

*Developmental neuropsychobiology.

P--Primary
S--Secondary

GUIDE 3.—*Disciplinary foci of the theories—Continued*

Theorists	Abbreviated titles	Psychiatry	Psychology--general	Psychology--learning	Social psychology	Developmental psychology	Sociology	Criminology	Anthropology	Biology	Genetics	Biomedical sciences	Neurosciences	Other
ith	Perceived Effects Theory		P	S										
otts and Shontz	Life-Theme Theory	S	P											
anton	Family Theory	P	P		S	P	S		S					
effenhagen	Self-Esteem Theory					P								
n Dijk	Cyclical Process Theory	P			S		S							
kler	Conditioning Theory	P		S	S					S		P	S	
nick	Role Theory				S		P							
rmser	Defense-Structure Theory	S												Psychoanalysis (P)
aberg	Social Control Theory	P					P							

-Primary
-Secondary

GUIDE 4.—*Organization of the volume*

	Part 1		Part 2					
				Theory components (page numbers)				
Theorists	Full title of chapter	Page	Abbreviated title	Initiation	Continuation	Transition: Use to abuse	Cessation	Relapse
HEORIES ON ONE'S ELATIONSHIP TO SELF								
avid P. Ausubel, M.D., h.D.	An Interactional Approach to Narcotic Addiction	4	Personality-Deficiency Theory	313	336	357	378	--
teven R. Gold, Ph.D.	The CAP Control Theory of Drug Abuse	8	Cognitive Control Theory	316	338	360	382	404
onald W. Goodwin, Ph.D.	The Bad-Habit Theory of Drug Abuse	12	Bad-Habit Theory	317	339	--	383	404
ichard L. Gorsuch, Ph.D.	Interactive Models of Nonmedical Drug Use	18	Multiple Models Theory	317	339	360	383	--
eorge B. Greaves, Ph.D.	An Existential Theory of Drug Dependence	24	Existential Theory	318	340	361	385	404
dward J. Khantzian, M.D.	An Ego/Self Theory of Substance Dependence	29	Ego/Self Theory	323	345	364	388	407
lfred R. Lindesmith, Ph.D.	A General Theory of Addiction to Opiate-Type Drugs	34	General Addiction Theory	324	346	365	389	407
arvey Milkman, Ph.D. illiam Frosch, Ph.D.	Theory of Drug Use	38	Coping Theory	326	349	367	393	412
eginald G. Smart, Ph.D.	An Availability-Proneness Theory of Illicit Drug Abuse	46	Availability and Proneness Theory	330	352	373	397	414
ene M. Smith, Ph.D.	Perceived Effects of Substance Use: A General Theory	50	Perceived Effects Theory	330	352	373	397	415

GUIDE 4.—*Organization of the volume—Continued*

	Part 1		Part 2					
				Theory components (page numbers)				
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THEORIES ON ONE'S RELATIONSHIP TO OTHERS								
Isidor Chein, Ph.D.	Psychological, Social, and Epidemiological Factors in Juvenile Drug Use	76	Disruptive Environment Theory	314	337	358	380	--
Sandra B. Coleman, Ph.D.	Incomplete Mourning and Addict/Family Transactions: A Theory for Understanding heroin Abuse	83	Incomplete Mourning Theory	315	337	358	381	402
Harris E. Hill, Ph.D.	The Social Deviant and Initial Addiction to Narcotics and Alcohol	90	Social Deviance Theory	319	--	363	--	--
George J. Huba, Ph.D. oseph A. Wingard, Ph.D. Peter M. Bentler, Ph.D.	Framework for an Interactive Theory of Drug Use	95	Interactive Framework	320	341	--	387	405
Richard Jessor, Ph.D. Shirley Jessor, Ph.D.	A Social-Psychological Framework for Studying Drug Use	102	Problem-Behavior Theory	--	--	--	--	--
Bruce D. Johnson, Ph.D.	Toward a Theory of Drug Subcultures	110	Drug Subcultures Theory	321	342	363	387	406

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enise B. Kandel, Ph.D.	Developmental Stages in Adolescent Drug Involvement	120	Developmental Stages Theory	322	343	--	--	--
oward B. Kaplan, Ph.D.	Self-Esteem and Self-Derogation Theory of Drug Abuse	128	Self-Derogation Theory	322	345	--	388	407
an Loney, Ph.D.	The Iowa Theory of Substance Abuse Among Hyperactive Adolescents	132	Hyperactive Adolescents Theory	325	347	365	389	--
illiam E. McAuliffe, Ph.D. obert A. Gordon, Ph.D.	Reinforcement and the Combination of Effects: Summary of a Theory of Opiate Addiction	137	Combination-of-Effects Theory	325	347	366	390	408
tanton Peele, Ph.D.	Addiction to an Experience: A Social-Psychological-Pharmacological Theory of Addiction	142	Addictive Experiences Theory	327	350	368	394	413
. Duncan Stanton, Ph.D.	A Family Theory of Drug Abuse	147	Family Theory	331	353	375	399	416
.A. Steffenhagen, Ph.D.	Self-Esteem Theory of Drug Abuse	157	Self-Esteem Theory	332	354	376	399	417
.K. van Dijk, M.D.	Biological, Psychogenic, and Sociogenic Factors in Drug Dependence	164	Cyclical Process Theory	333	355	--	--	--
braham Wikler, M.D.	A Theory of Opioid Dependence	174	Conditioning Theory	333	355	--	400	417

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Theorists	Full title of chapter	Page	Abbreviated title	Initiation	Continuation	Transition: Use to abuse	Cessation	Relapse
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oward S. Becker, Ph.D.	The Social Bases of Drug-Induced Experiences	180	Social Influence Theory	--	--	--	--	--
alvin J. Frederick, Ph.D.	Drug Abuse as Learned Behavior	191	Learned Behavior Theory	316	338	359	382	403
erbert Hendin, M.D.	Psychosocial Theory of Drug Abuse: A Psychodynamic Approach	195	Adaptational Theory	318	340	362	385	405
ving F. Lukoff, Ph.D.	Toward a Sociology of Drug Use	201	Sociological Perspective	--	--	--	--	--
jendra K. Misra, D. Phil.	Achievement, Anxiety, and Addiction	212	Achievement-Anxiety Theory	327	--	368	393	413
e N. Robins, Ph.D.	The Natural History of Drug Abuse	215	Natural History Perspective	328	--	370	395	--
arles Winick, Ph.D.	A Theory of Drug Dependence Based on Role, Access to, and Attitudes Toward Drugs	225	Role Theory	334	--	376	400	419
rman E. Zinberg, M.D.	The Social Setting as a Control Mechanism in Intoxicant Use	236	Social Control Theory	--	--	--	--	--

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ORIES ON ONE'S ATIONSHIP TO NATURE								
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ent P. Dole, M.D. e E. Nyswander, M.D.	Methadone Maintenance: A Theoretical Perspective	256	Metabolic Deficiency Perspective	--	--	--	--	402
Hochhauser, Ph.D.	A Chronobiological Control Theory	262	Biological Rhythm Theory	320	341	363	386	405
s F. Jonas, Ph.D. avid Jonas, M.D.	A Bioanthropological Overview of Addiction	269	Bioanthropological Theory	--	--	--	--	--
am R. Martin, M.D.	Emerging Concepts Concerning Drug Abuse	278	Neuropharmacologic Theory	--	--	--	--	--
s W. Prescott, Ph.D.	Somatosensory Affectional Deprivation (SAD) Theory of Drug and Alcohol Use	286	Social Neurobiological Theory	327	350	369	395	413
A. Schuckit, M.D.	A Theory of Alcohol and Drug Abuse: A Genetic Approach	297	Genetic Theory	328	351	371	395	414
J. Simon, Ph.D.	Opiate Receptors and Their Implications for Drug Addiction	303	Opiate Receptor Perspective	--	--	--	--	--

GUIDE 8.—*Theory boundaries*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Ausubel	Opiates	--	All	Both	General	--	Personality-Deficiency Theory	Drug availability, euphoria, inadequate personality syndrome, anxiety reduction, coping/adjustive properties of drugs, addict/peer influence
Becker	Drugs--general	Psychedelics	All	Both	General	--	Social Influence Theory	Social set, perceived drug effects, social influence and orientation, drug knowledge, drug-using culture
Bejerot	Drugs--general	--	All	Both	General	--	Addiction-to-Pleasure Theory	Pleasure/pain balance, curiosity, peer/parent influence, biological drive, learning/conditioning, pleasure as a biological preference system, dependence as a memory function, independent will
hein	Opiates	--	Youths, adolescents	Both	General	--	Disruptive Environment Theory	Disrupted family life, socioeconomic status, peer influence, personality deficiency, delinquency, low self-esteem, emptiness/alienation

GUIDE 8.—Theory boundaries—Continued

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Coleman	Opiates	Alcohol, drugs--general	All	Both	General	--	Incomplete Mourning Theory	Search for meaning; family systems; influence; death, separation, and loss; helplessness/hopelessness; religiosity/alienation
Dole and Nyswander	Opiates	Methadone	All	Both	General	--	Metabolic Deficiency Perspective	Narcotic blockade, metabolic disease, physical dependence, curiosity, abstinence syndrome, withdrawal avoidance
Frederick	Drugs--general	--	All	Both	General	--	Learned Behavior Theory	Learning, reinforcement, tension reduction, distructive vs. constructive factors, risk taking
Gold	Drugs--general	Opiates	All	Both	General	--	Cognitive Control Theory	Cognitive style, cognitive conflict and control, anxiety, self-deprecation, powerlessness
Goodwin	Drugs--general	Alcohol	All	Both	General	--	Bad-Habit Theory	Habit, classical conditioning, genetic susceptibility, avoidance of withdrawal symptoms, addictive cycle

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
orsuch	Drugs--general	--	All	Both	General	--	Multiple Models Theory	Multiple causes, parent and peer pressure and socialization, sensation seeking, relief from boredom, conformity, pain relief
reaves	Drugs--general	--	All	Both	General	--	Existential Theory	Impaired somatic feedback, sense of well-being, pursuit of altered consciousness, automedication, humorless lifestyle
ndin	Drugs--general	--	All	Both	General	--	Adaptational Theory	Adaptive/defensive function, social constriction/entrapment, peer/family influence, self-destructiveness, self-esteem, achievement/performance competition

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
	Opiates	Alcohol	Youths, adolescents, adults	Both	Americans	--	Social Deviance Theory	Social deviance models, social control deficiencies, immediate gratification, euphoria/hypophoria, reinforcement, withdrawal avoidance, conflict/aggression reduction, drug availability, anxiety reduction
chhauser	Drugs--general	--	All	Both	General	--	Biological Rhythm Theory	Biological rhythms, self-medication, helplessness
ba, Wingard, Bentler	Drugs--general	--	All	Both	General	--	Interactive Framework	Behavioral styles; biological, intrapersonal, interpersonal, and sociocultural interactions; person-environment interactions; self-perceived behavioral pressures

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Jessor and Jessor	Drugs--general	--	Youths, adolescents, adults	Both	General	--	Problem Behavior Theory	Problem-behavior proneness, social influence/controls, alienation, self-esteem, locus of control, tolerance of deviance, achievement orientation, autonomy/independence, conventionality/unconventionality
Johnson	Marijuana, opiates, multiple drug use	Alcohol, drugs--general, depressants, psychedelics	Youths, adolescents	Both	General	--	Drug Subcultures Theory	Middle-class parent culture, conduct norms, values, cannabis subculture, heroin-injection subculture, drug distribution, peer culture
Jonas and Jonas	Drugs--general	Alcohol, stimulants, narcotics	All	Both	General	The individual is viewed on the basis of his/her standing (or perception of standing) within a social group	Bioanthropological Theory	Hypersensitivity to stimuli, social influence, neurophysiological influence, phylogeny, population density/control, species viability/survival, euphoria, population vs. individual gene pools

GUIDE 3.—Theory boundaries—Continued

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Kandel	Drugs--general	Tobacco, alcohol	Youths, adolescents	Both	General	--	Developmental Stages Theory	Prior drug use, parental relations and influence, peer influence, beliefs and values, deviant behavior
Kaplan	Drugs--general	--	All	Both	General	Applies only to groups in which drug use is contranormative	Self-Derogation Theory	Self-esteem motive, self-rejecting attitudes, nonnormative group membership and expectations
Khantzian	Opiates	Drugs--general	All	Both	General	--	Ego/Self Theory	Psychopathology, ego impairment/function, self-care/self-preservation, aggression/rage, self pathology, narcissism, self-selection, coping strategies
Lindesmith	Opiates, opiate-type synthetics	Alcohol	All	Both	General	--	General Addiction Theory	Physical dependence, withdrawal avoidance, learning, reinforcement, cognitive awareness of dependence

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Loney	Drugs--general, stimulants	--	Youths, adolescents	Males	White Americans	--	Hyperactive Adolescents Theory	Aggression, rebelliousness, parental and peer influence, self-esteem, social class
Lukoff	Marijuana, opiates	Drugs--general	Youths, adolescents	Males	General	--	Sociological Perspective	Drug use as epiphenomenon, cultural and structural parameters, retreatism, social location, normative systems and socialization, peer culture/influence, family influence/isolation
Martin	Drugs--general	Opiates	All	Both	General	--	Neuropharmacologic Theory	Opioid receptors, psychopathology, hypophoria, euphoria, depression, neurotransmitters, protracted abstinence syndrome
McAuliffe and Gordon	Opiates	Drugs--general	All	Both	General	--	Combination-of-Effects Theory	Euphoria, withdrawal avoidance, self-medication, operant reinforcement, intermittent reinforcement, lifestyle changes, insidious onset

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Milkman and Frosch	Drugs--general	Stimulants, depressants	All	Both	General	--	Coping Theory	Ego-state alteration, sensory overload, stress reduction, coping, peer influence, addictive processes
Misra	Drugs--general	--	All	Both	General	--	Achievement-Anxiety Theory	Fear of failure, apathy, achievement, anxiety, emotional inhibition, escapism
Peele	Drugs--general	Alcohol, tobacco	All	Both	General	--	Addictive Experiences Theory	Psychosocial and pharmacological interaction; perceived drug experiences; anxiety, pain, and stress relief; guilt; setting; environment; coping ability
Prescott	Alcohol, marijuana, stimulants, depressants, opiates	Tobacco, psychedelics	All	Both	General	--	Social Neurobiological Theory	Neurophysiological needs and predispositions, social isolation, emotional/affective deprivation, quality/quantity of sensory experiences, stimulation seeking vs. avoidance, opiate receptors and endorphins

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Robins	Drugs--general	--	All	Both	General	--	Natural History Perspective	Disrupted family, nonconformity, antisocial behavior, peer influence, drug availability, antisocial personality
Schuckit	Alcohol	Drugs--general	All	Both	General	--	Genetic Theory	Genetic predisposition, socioenvironmental influences
Simon	Opiates	Drugs--general	All	Both	General	--	Opiate Receptor Perspective	Opiate receptors, opiate-induced euphoria/dysphoria, endogenous opioid peptides, endorphins/enkephalins, pain modulation/analgesia, abstinence syndrome
Smart	Drugs--general	--	All	Both	General	--	Availability and Proneness Theory	Addiction proneness, drug availability, lifestyle enhancement, escapism

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Smith	Drugs--general	--	Youths, adolescents	Both	General	--	Perceived Effects Theory	Perceived effects, self-worth/self-concept, substance availability, social influence, rebelliousness/obedience, sensation seeking, low need achievement, withdrawal aversiveness, self vs. ideal self, present vs. future orientation
Spotts and Shontz	Drugs--general	Stimulants, depressants, psychedelics, opiates	Adults	Males	General	Derived from intensive and extensive studies of individuals; may or may not apply in massed data (i.e., group averages on isolated variables measured by dimensional rather than morphogenic means)	Life Theme Theory	Personal structure, lifestyle, ego, life themes, myths, ego deficiency, family dynamics

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Stanton	Drugs--general	Opiates	Youths, adolescents, adults	Both	General	--	Family Theory	Arrested crisis resolution, family homeostatic model, traumatic loss, fear of separation, parent/child over-involvement, pseudo-individuation, triadic interaction, family addiction cycle
Steffenhagen	Drugs--general	--	All	Both	General	--	Self-Esteem Theory	Self-esteem, drug availability, feelings of inferiority/superiority, social pressure/acceptability, coping mechanism, immediate gratification, social milieu, lifestyle
van Dijk	Drugs--general	--	All	Both	General	--	Cyclical Process Theory	Stages of use, social meaning of use, disposition, discomfort relief, psychosocial cyclical processes

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Wikler	Opiates	Drugs--general	Youths, adolescents, adults	Both	General	Applies mainly to "street addicts," for whom there is no bona fide medical indication for administration of opioids	Conditioning Theory	Euphoria/dysphoria; acute, protracted, and conditioned abstinence syndrome; social-environmental influences and stimuli; primary and secondary pharmacologic reinforcement; anxiety and hypophoria reduction; reinforcement and conditioning; exteroceptive and interoceptive stimuli; pharmacologic need/narcotic hunger
Winick	Drugs--general	--	All	Both	General	--	Role Theory	Role strain/deprivation, attitudes toward drugs, drug availability

GUIDE 5.—*Theory boundaries—Continued*

Theorists	Drug foci		Population specificity				Abbreviated titles	Key variables
	Primary	Secondary	Age	Sex	Ethnicity	Other		
Wurmser	Drugs--general	--	All	Both	General	--	Defense-Structure Theory	Ego/superego deficits and splits, developmental disturbance/ trauma, anxiety, affective regression/defense, sociopathy, narcissism, externalization, self-esteem, phobic core, claustrophobia
Zinberg	Drugs--general	Alcohol, heroin	All	Both	General	--	Social Control Theory	Set and setting, social sanctions and rituals, social learning, controlled drug use, cognitive conflict, cultural models of decorum

PART 1

THEORETICAL PERSPECTIVES AND OVERVIEWS

THEORIES ON

One's Relationship to Self

An Interactional Approach to Narcotic Addiction

David P. Ausubel, M.D., Ph.D.

As in other fields of medicine and the behavioral sciences, an interactional approach to the etiology, epidemiology, psychopathology, and treatment of narcotic addiction implies the operation of multiple causality within the person, in the environment, and in the interaction between them. One must consider both long-term predisposing factors and more immediate precipitating factors.

The most important precipitating factor in narcotic addiction is degree of access to narcotic drugs. This factor, for example, explains in part why narcotic addiction rates are higher in the urban slums than in middle-class suburbs and why the incidence of narcotic addiction approached the zero level during World War II when normal commercial channels in the illicit narcotics trade were disrupted. Thus, no matter how great the cultural attitudinal tolerance for addictive practices is, or how strong individual personality predispositions are, nobody can become addicted to narcotic drugs without access to them. Hence the logic of a law enforcement component in prevention.

The second most important predisposing factor in the etiology of narcotic addiction is the prevailing degree of attitudinal tolerance toward the practice in the individual's cultural, subcultural, racial, ethnic, and social class milieu. This factor explains differences in incidence rates between lower class and middle-class groups, between Europeans, Americans, and Orientals (except the Japanese), and between members of the medical and allied health professions and other occupational groups (Ausubel 1961, 1962, 1966).

The crucial and determinative predisposing factor, which, therefore, constitutes the most acceptable basis for the nosological categorizing of narcotic addicts, is the possession of those idiosyncratic or developmental personality traits for which narcotic drugs have adjustive properties. Thus it is obvious that narcotic drugs are more addictive than, say, milk of magnesia, because their greater psychotropic effects have adjustive value for these personality traits. Chief among these effects is euphoria, which is highly adjustive for inadequate personalities, i.e., motivationally immature individuals lacking in such criteria of ego maturity as long-range goals, a sense of responsibility, self-reliance and initiative, volitional and executive independence, frustration tolerance, and the ability to defer the gratification of immediate hedonistic needs for the sake of achieving long-term goals (Ausubel 1947, 1948, 1952a,b, 1958,a,b, 1961, 1962, 1966, 1980a,b; Ausubel and Ausubel 1963; Ausubel and Spalding 1956). Several clinical studies of hard-core addict populations (e.g., Ausubel 1947; Dai 1937; Pescor 1939; Research Center for Human Relations 1957a; Zimmering et al. 1951, 1952) have shown that most chronic narcotic addicts fall in this diagnostic category. Other studies (Ausubel 1947; Chein et al. 1964; Dai 1937; Research Center for Human Relations 1957a) have uncovered in the life histories of such addicts those types of parent-child relationships, i.e., overpermissive (underdominating), overprotecting, and overdominating parents, that tend to foster the development of the inadequate personality syndrome.

Contributory factors in the development of this syndrome are probably genic (polygenic) in origin and are undoubtedly fostered by lower social-class membership, particularly in families that have been on welfare for one or more generations. Most of such latter youth, of course, are not motivationally inadequate and tend to be sporadic narcotic users who do not become either physiologically or psychologically dependent upon the drugs in question. Epidemiological studies by the New York University Research Center for Human Relations (1957a) have developed various behavioral, familial, and socioeconomic criteria for differentiating between these two groups.

Because of these euphoric properties of narcotic drugs effected through depression of the self-critical faculty and the positive pleasure of the "rush," addicts receive an immediate, unearned form of gratification and ego enhancement. These same euphoric properties are also obviously adjustive for persons with histories of recurrent reactive depression. Recent studies with endogenously produced opiates, i.e., endorphins and enkephalins (Costa and Trabucchi 1978; Goldstein 1976c; Snyder 1977), suggest that in some instances deficiencies in the production of the substances that contribute to normal optimism in the face of life's vicissitudes (and hence have evolutionary survival value for the species) contribute toward the incidence of narcotic addiction. A recent study of psychiatrically disabled, treated narcotic addicts (Ausubel 1980a) shows that lower middle- and working-class addicts tend almost exclusively to develop severe anxiety states and reactive depressions when under psychological or environmental stress, whereas addicts from urban slum welfare backgrounds almost invariably develop schizophrenic symptoms under similar circumstances. This difference in pathological outcome probably reflects some insidious internalization of mature motivational traits by the lower middle- and working-class addicts despite the overt domination of the personality traits of the inadequate personality.

Another psychopharmacological effect of opiates, namely, sedation or relief of anxiety, probably accounts for the small minority of narcotic addicts who suffer from disabling neurotic anxiety. Such individuals, particularly members of the medical and allied health professions, typically take small, well-controlled doses of morphine subcutaneously (rather than large doses of heroin intravenously) for their sedative rather than their euphoric properties. Typically their addiction is well disguised and seldom recognizable (Jaffe 1970a,b).

Widespread sporadic use of heroin in adolescents with relatively normal personality structures is generally reflective of the aggressive, antiadult orientation characterizing adolescents in our culture. Here the personality predisposition is developmental rather than idiosyncratic.

Apart from the aforementioned affirmative clinical evidence supporting the existence of personality predispositions for which narcotic drugs have adjustive value, the very logic of this proposition itself is compelling. How else could one explain why, in a given urban slum neighborhood with uniform access to narcotic drugs and uniform subcultural or ethnic attitudinal tolerance for narcotic addiction, the vast majority of adolescents become only sporadic, nonaddicted drug users, whereas a relatively small minority become chronically addicted?

A separate nosological category of addiction can probably be made to include minority-group youths with normal or even better-than-average motivational maturity who use narcotic drugs chronically for limited periods of time because they perceive the odds of achieving any ordinary degree of academic or vocational success as so overwhelmingly stacked against them.

Finally, a very small minority of narcotic addicts may be classified as psychopathic or sociopathic personalities (Kolb 1925a,b). Drug addiction, insofar as it is regarded as a disreputable or socially disapproved habit, obviously has nonspecific adjustive value for such persons; however, it provides only one of many available nonspecific outlets for aggression or "acting out" behavior against society. Such addicts tend to commit the violent, remorseless crimes that are popularly and erroneously associated in the public mind with drug addicts generally. Actually, of course, the sedative action of narcotics tends to inhibit violence of any kind unless addicts are particularly desperate for their next "fix."

For the most part, except for the relatively rare psychopathic addict, most chronic addicts engage in nonviolent, remunerative crimes primarily to support their habits, e.g., "pushing," "con" games, shoplifting, check forgery, "paperhanging," fraudulent magazine subscriptions, etc. (Chein et al. 1964; Kolb 1925a). The percentage of addicts involved in preaddiction delinquency is generally lower than that of nonaddict narcotic users who are members of delinquent gangs in urban slum areas (Ausubel 1958a,b; Research Center for Human Relations 1957a). In any case, delinquent addicts tend to be involved in more remunerative delinquencies directed toward satisfying their drug habits than in the more violent, predatory gang activities and "rumbles" (or gang warfare) (Research Center for Human Relations 1957a).

SPECIAL POPULATIONS

ALCOHOLISM AND OTHER DRUG ABUSE IN NARCOTIC ADDICTS

Addicts in methadone maintenance programs, when deprived of their heroin-induced euphoria, turn to the euphoria-inducing properties of alcohol, large doses of barbiturates, amphetamines, benzodiazepines, and amitriptyline. Sometimes overdosage of these drugs leads to accidental or, in reactive depressives, to deliberate suicide. Reference has already been made to the relationship between addiction, on the one hand, and psychopathology and criminality, on the other.

It is generally agreed that most addicts have a preferred drug that is most adjustive for their particular idiosyncratic or developmental personality defects and that they use other drugs only when deprived of access to their drug of choice. Heroin and marijuana, for example, each have their own separate constituencies based on their distinctive psychopharmacological effects. The use of marijuana does not predispose an individual to heroin use except insofar as it may "break the ice" for more dangerous drug use. Narcotic addicts tend in general to have a history of prior marijuana use because the latter drug is more accessible, cheaper, and considered less dangerous and less socially disapproved. The connection between the two types of drugs is not causal: The converse of this proposition is not true, i.e., the vast majority of marijuana users exhibit no later history of heroin abuse (Robins et al. 1970).

PHYSICIAN ADDICTS

Clinical experience with large numbers of physician addicts at the Lexington Hospital indicates that there are essentially two different kinds of underlying predispositions: (1) the intelligent, overdominated inadequate personality who was forced into the profession by parents seeking vicarious ego enhancement, and who later rejects the goals of adult maturity as a measure of revenge against parental overdomination as soon as the parent dies or ceases to be autocratic, and (2) the anxiety neurotic who uses small, controlled doses of morphine subcutaneously to relieve anxiety rather than to obtain euphoria. These are typically highly achievement-oriented persons who seek in unusual accomplishment the ego enhancement and sense of intrinsic self-esteem never possessed because their parents either rejected them or failed to accept them for themselves (perceiving them solely as sources for vicarious ego enhancement).

The CAP Control Theory of Drug Abuse

Steven R. Gold, Ph.D.

With our current incomplete understanding of drug use and abuse, the appropriate function of any theoretical model may be to stimulate new work in the area. The aim of this paper is to describe a theory of drug abuse that can be empirically evaluated and to encourage additional research and theory development.

The CAP control theory emphasizes the interaction of the individual's style and the affective experience of drug use with the drug's pharmacogenic effect. These are the basic ingredients of the cognitive-affective-pharmacogenic (CAP) control theory of addiction (Coghlan et al. 1973; Gold and Coghlan 1976). The cognitive style of the drug abuser is viewed as the pivotal factor in an individual's moving from drug experimentation to drug abuse. The cognitive dimension will therefore be discussed first.

There is a current trend in behavior therapy emphasizing cognitive approaches (Lazarus 1976; Mahoney 1977; Meichenbaum 1977). The major tenets of cognitive behavior therapy are that human behavior is mediated by unobservables that intervene between a stimulus and the response to that stimulus. Beliefs, sets, strategies, attributions, and expectancies are examples of the types of mediating constructs currently considered crucial to an understanding of emotion and behavior. Second, the way an individual labels or evaluates a situation determines his or her emotional and behavioral response to it. A third basic assumption is that thoughts, feelings, and behaviors are causally interactive (Mahoney 1977).

To tie the cognitive approach to drug abusers, the CAP control theory posits that the abuse process begins with conflict as a predisposing factor. People who are having difficulty in meeting demands or expectations placed upon them by society or by themselves are in conflict, and a consequence of the stress of conflict is anxiety. Anxiety is a universal feeling, something most of us experience to some degree each day. It is not the experience of anxiety but the individual's interpretation of the anxiety that is crucial to the theory. Underlying the anxiety of drug abusers is a belief that they cannot alter or control the situation; that they are powerless to affect their environment and

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decrease or eliminate the sources of stress. The belief that they are powerless to cope with stress is the major cognitive distortion of drug abusers. One consequence of this is the intense feeling of low self-esteem that is a well-known clinical entity among drug abusers (Krystal and Raskin 1970). Feelings of self-depreciation, which form the belief that one is powerless, represent the affective component of the CAP theory.

The experience of anxiety is, of course, uncomfortable, and a means of anxiety reduction is necessary. A primary pharmacogenic effect of heroin is anxiety reduction. Not only does the drug provide relief from anxiety, but the individual obtains a temporary ecstatic feeling--a "high." Under the influence of the drug the individual temporarily experiences an increased sense of power, control, and well being. The sense of powerlessness is replaced by an exaggerated sense of being all powerful--no task is too great and no feat impossible while "high." Thus, drugs can do for abusers what they believe they cannot do for themselves: get rid of anxiety, lead to good feeling about themselves, and make them believe they are competent, in control, and able to master their environment.

Unfortunately for the drug abuser, the drug effects are short lived and any temporary gains turn into long-term losses. Inevitably, after the high wears off some internal or external source of stress will rekindle the conflict and anxiety. Not only do the old feelings of lack of control return but they are likely to be even stronger than before. It is this increasing sense of powerlessness with increased drug use that leads the individual from drug use to abuse. Each time drug users rely on a drug to relieve tension and feel good about themselves, they become a little less capable of coping on their own. By using drugs to cope, the individual is cut off from learning other more adaptive coping mechanisms and becomes less tolerant of the pain of anxiety. The drug user now knows that anxiety does not have to be tolerated, as drug taking has been successful in the past in removing tension and producing good feelings. It is therefore expected that drug use will increase both in frequency and in the number of different situations in which it is employed. For example, arguments with parents may be a primary source of conflict and anxiety for the adolescent drug abuser. Drug taking will frequently follow such an argument. An adolescent experiencing school-related stress, having learned that drug taking is an effective means of anxiety reduction, may turn to additional drug taking to compensate for academic failures. The reliance on drugs to cope with stress therefore creates a vicious cycle; the more drugs are used, the more the individual believes they are necessary. Each drug experience serves to confirm for users the belief that they are powerless to function on their own.

The CAP model of drug abuse also makes several assumptions about the treatment of drug abuse. First, effective and lasting change is based on learning that behavior has consequences and that one can have an effect on his or her own life. To replace a sense of powerlessness with a sense of mastery, the abuser has to be taught alternative ways of responding to external or internal stress. These alternative ways cannot, however, be developed, practiced, and adopted as long as the individual continues to use drugs.

A second assumption is that an effective treatment plan must be multimodal (Lazarus 1976). A complete treatment plan must assess not only the overt behavior of drug taking but the negative emotions (e.g., anxiety), unpleasant physical sensations (e.g., aches and pains that accompany withdrawal), intrusive images (e.g., recollections of past failures), faulty cognitions (e.g., "nothing I do will ever be successful"), and interpersonal inadequacies (e.g., difficulty in making friends with non-drug-taking peers). Each of the individual's problem areas may require a specific treatment strategy. For example, systematic desensitization may be used to help the abuser cope with anxiety, while cognitive restructuring may be needed to correct the faulty cognitive processes.

The multimodal therapy approach is consistent with the CAP theory in that both stress the interaction between personality modalities, and both suggest that in complex human problems a lasting result depends upon addressing all relevant aspects of the individual's functioning. The high recidivism rate, characteristic of drug abuser treatment, may be due to treatment focusing on a limited aspect of the abuser's overall personality functioning and lifestyle (Platt and Labate 1976).

RESEARCH SUPPORT FOR THE CAP THEORY

The CAP theory of drug abuse was developed primarily on experiences gained working with adolescent drug abusers at Holy Cross Campus, a coed residential treatment center in Rhinecliff, New York (Coghlan et al. 1973). To evaluate the effectiveness of the treatment program and the CAP model, adolescents completed two personality tests, once approximately 30 days after admission and again six months later (Gold and Coghlan 1976). The Rotter Locus of Control (I-E) Scale (Rotter 1966) was used to assess whether an individual believed reinforcement to be contingent on personal efforts and behavior (internal control) or a result of luck, fate, chance, or more powerful others (external control). A second scale, the Self-Esteem Survey (SES) was also used as a measure of self-evaluation (Coopersmith 1967). It was predicted that after six months in residential treatment the adolescents would move toward more internal control and greater self-esteem. Data based on 32 males and 21 females provided some support for the hypotheses. Females became significantly more internally oriented. Both males' and females' scores on the SES reflected higher self-esteem, though the change was not statistically significant. A second important finding was a significant correlation for the females between low self-esteem and both running away and self-destructive acts (Gold and Coghlan 1976).

The role of perceived control has been examined in a series of studies by Seligman and his associates (Seligman 1975; Maier and Seligman 1976). A belief in external causation or control may dramatically impair learning and functioning. The research paradigm is as follows: One group of subjects is exposed to a situation in which their behavior can control the occurrence of an aversive event, while another group experiences the same situation except that the aversive event is beyond their control. When both groups are next presented with a new situation in which learning is required, the typical finding is that people who previously experienced control learn faster in the new situation. Moreover, some subjects, after experiencing the lack of control, may not learn at all even though the task is often quite simple. Seligman (1975) interprets such findings as indicating that, when an organism's behavior has no effect on its environment, "learned helplessness" is the result. The learned-helplessness theory has been suggested as a model for the development of reactive depression. It also points out a way in which the sense of helplessness or powerlessness may be a characteristic of drug abusers. Individuals prone to drug abuse may be those who have a history of lack of relationship between their responses and consequences--a series of learning experiences which teach them they are not effective in altering or influencing their environment. For example, studying may have no effect on grades received; behaving as demanded by parents may not lead to being loved; hard work may not lead to a promotion or better job; etc.

The similarities between a model of reactive depression and drug abuse are not surprising, as there are aspects of drug abuse that parallel depression. Drug abuse can be described as a self-destructive activity and often is clinically viewed as a form of "slow suicide." Gold and Coghlan (1976) found a relationship between adolescent female abusers' belief in external control and low self-esteem with overt self-destructive behavior. Wetzel (1976) studied 154 suicide attempters, threateners, and psychiatric controls and found that a sense of hopelessness was highly correlated with suicidal behavior, even more so than depth of depression.

The effects of perceived control have also been studied with reference to coping with aversive stimulation. For example, Geer et al. (1970) found that college students who falsely believed they had control over the duration of shocks received displayed less physiological response to the shock. The finding of less arousal suggests that the shocks were becoming less stressful for them. Turk (1975) trained volunteers to develop different coping strategies to deal with pain to encourage them to believe they could successfully manage it. Cognitively trained subjects were able to tolerate the pain for almost twice as long as untrained subjects.

In summary, the CAP theory of drug abuse emphasizes the interaction of cognitive-affective-pharmacogenic effects of drug taking. The belief that one is powerless to affect the environment and cope with stress plays a central role in the theory. The CAP theory is seen as being consistent with newer cognitive models which emphasize the role of internal thoughts and beliefs in the development of maladaptive behavior. Research findings support the hypothesis that an individual's belief in the ability to control a situation strongly influences behavior. Successful treatment of the drug abuser requires a multimodal approach which alters faulty thinking, teaches new interpersonal skills, helps the abuser cope with pain and anxiety, and encourages the development of a positive self-image.

The Bad-Habit Theory of Drug Abuse

Donald W. Goodwin, M.D.

INTRODUCTION

By "bad habit" I refer to repetitious, harmful, semireflexive behavior resulting from classical conditioning in "susceptible" individuals. With regard to drugs, "susceptibility" may be specific for certain drugs or nonspecific, i.e., the individual may be susceptible to abusing a number of drugs, perhaps only in certain classes (e.g., the sedative-hypnotics) or perhaps across classes (e.g., opiates, sedative-hypnotics, nicotine, etc.). Susceptibility may be partly inherited (under some degree of genetic control), or it may reflect purely psychosocial influences, or both. These issues are complicated, and a global theory of addiction may be premature. My theory is limited to alcoholism, but I have included a brief discussion of the possibility that theories of alcoholism may help to explain other forms of substance abuse.

WHAT IS INHERITED?

Perhaps the strongest evidence for a genetic factor in alcoholism is the evidence that alcoholism strongly runs in families (Cotton 1979). This, combined with findings from twin and adoption studies, at least suggests the possibility of a hereditary factor (Goodwin 1979). If so, what is inherited?

Certain behaviors associated with drinking must be explained before it is known why serious drinking problems develop in perhaps one of 12 or 15 drinkers in Western countries. These core features must be explained: (1) loss of control, (2) tendency to relapse, and (3) tolerance. The following explanations blend possible genetic and nongenetic factors.

Indisputably, there is a wide range of innate variations in response to alcohol. This is true in humans and every species studied. There are not only strain and species differences but also differences between individuals. It is difficult to account for this variation other than to ascribe it to innate, probably genetically controlled influences.

In humans, the most conspicuous example of innate variation in alcohol response has been shown in Orientals, whose low alcoholism rates have usually been attributed to social factors. However, three studies have now shown that small amounts of alcohol cause a cutaneous flush and unpleasant reactions in about three-quarters of Orientals (Wolff 1973; Ewing et al. 1974; Seto et al. 1978), indicating that a large number of Orientals are physiologically intolerant of alcohol. The biochemical basis for these adverse reactions has not been determined, but recent data indicate a high frequency of atypical liver alcohol dehydrogenase among Japanese (Stamatoyannopoulas et al. 1975). This coenzyme may alter the metabolism of alcohol, leading to increased formation of acetaldehyde, and this may explain the flush and other ill effects (such as nausea).

Other groups with relatively low alcoholism rates may be similarly protected by an innate sensitivity to alcohol. For example, fewer women than men are alcoholic, and one study reports that women have higher blood alcohol levels after ingesting a given amount of alcohol than do men (Jones and Jones 1976). Informal surveys suggest that a substantial proportion of women experience unpleasant physical effects after modest amounts of alcohol (e.g., nausea and headache). Anecdotal evidence also suggests that more Jews than non-Jews have adverse physical reactions to modest amounts of alcohol, which may contribute to the low prevalence of alcoholism among Jews.

It is obviously essential to be able to drink large quantities of alcohol to be alcoholic. Many people are prevented from this because of innate cutoff points almost certainly under genetic control. That genetic control is an important factor in drug metabolism in general has been demonstrated by numerous studies showing that identical twins metabolize a wide variety of drugs (including alcohol) at almost identical rates, while fraternal twins have widely disparate rates of metabolism (Vesell et al. 1971). Whether the development of alcoholism is also subject to some genetic control remains conjectural.

It is widely believed that tolerance to alcohol is acquired mainly from "practice"; the more a person drinks, the more he or she needs to drink to get the same effect. With opiates, this clearly is true; with alcohol, it is not so clearly true. Animals fail to show much tolerance to alcohol, even after repeated exposure. Also, young men with almost no prior drinking experience vary widely in their response to alcohol in experimental studies (Goodwin et al. 1969). Some show almost no effect, while others are quite easily intoxicated. Since this variability does not correlate with prior drinking history, the only other explanation is that innate biological factors are responsible.

To summarize, large numbers of people are more or less "protected" from becoming alcoholic because of genetically determined adverse physical reactions to alcohol. If anything is inherited in alcoholism, it is probably the lack of intolerance for alcohol. (Parenthetically, it is interesting that Alcoholics Anonymous often refers to allergy as a factor in alcoholism, usually properly bracketing "allergy" in quotation marks. It now seems that this is indeed true, but it is the nonalcoholics, not the alcoholics, who are allergic!)

WHAT IS LEARNED?

Here, in brief, is a description of one way genetic and experiential factors may interact to produce alcoholism.

1. The potential alcoholic must be able to drink a lot (i.e., lack an intolerance for alcohol).

2. Some people experience more euphoria from alcohol than others do (Goodwin et al. 1979). This factor is also quite possibly under genetic control. Because euphoria is a positive reinforcer, presumably people who experience the most euphoria are the ones most likely to drink.

3. Like most drugs of abuse, alcohol is quickly absorbed and eliminated; the effects occur rapidly and disappear rapidly. Experimental studies indicate that alcoholics experience dysphoric as well as euphoric effects from alcohol (Mello 1975). Those individuals who experience the most euphoria (because of genetic factors) quite possibly also experience the most dysphoria, the cure for which is more alcohol. After a few drinks, these people may drink more to relieve the dysphoria than to restore the euphoria. In any case, during a single drinking period there may be two reinforcers involved: production of euphoria and reduction of dysphoria. This peak-valley effect may explain loss of control. The height of the peak and the depth of the valley may be genetically controlled.

4. For reasons described above, alcohol in genetically susceptible individuals may be massively reinforcing. The reinforcements occur during individual drinking periods and most strikingly "the morning after," when the "hair of the dog" swiftly relieves that formidable dysphoria known as a hangover. When loss of control leads to binge drinking, withdrawal symptoms occur (a super hangover).

5. After periods of abstinence, binge drinkers often relapse. This is one of the mysteries of alcoholism. If it is true that alcoholics continue heavy drinking mainly to curb dysphoriant effects, and if it is true that alcohol is a relatively weak euphoriant compared, say, to cocaine or amphetamines (Mayfield and Allen 1967), then why should a binge drinker start drinking again after experiencing horrendous effects from previous binges? Some alcoholics are sociopaths, and in their case relapse may be explainable as another instance of "not learning from experience." Most alcoholics, however, seem to learn from most experiences as well as the next person. Why relapse?

Stimulus generalization may be the answer. As noted, alcohol in genetically susceptible individuals is a massively reinforcing agent. Both the positive (euphoriant) and negative (dysphoriant) effects resemble mood states and physical feelings experienced in sobriety. The terms "euphoriant" and "dysphoriant" are used here as shorthand for "positive reinforcer" and "negative reinforcer," respectively. The former may resemble any type of rewarding experience, e.g., sex or the pleasure of receiving a gift. The latter may resemble hunger, fatigue, or feelings of loneliness, anxiety, and depression.

Through the process of stimulus generalization, the ups and downs introduced by alcohol become cued to a wide variety of internal states and external circumstances. Even heavy drinkers drink more on some occasions and in certain settings. These occasions and settings become associated with both the highs and the lows of drinking. They become conditioned stimuli, just as do the internal feelings that resemble the highs and lows of drinking.

Relapse represents a conditioned response to these conditioned stimuli. Since relapse is usually erratic and unpredictable, it is quite likely that a combination of "interoceptive" and "exteroceptive" conditioned stimuli are required to produce relapse. The necessary combination very likely differs between individuals and even in each individual from time to time. As Keller (1972) wrote,

> For any alcoholic there may be several or a whole battery of critical cues or signals. By the rule of generalization, any critical cue can spread like the tentacles of a vine over a whole range of analogs, and this may account for the growing frequency of bouts, or for the development of a pattern of continuous inebriation. An exaggerated example is the man who goes out and gets drunk every time his mother-in-law gives him a certain wall-eyed look. After a while he has to get drunk whenever any woman gives him that look.

The conditioning theory is not new. Wikler, Ludwig, and their associates (Ludwig and Wikler 1974; Ludwig et al. 1974) have described it in much detail. It remains a theory, and not an easy theory to test, at that. Combined with the genetic data, it has the advantage of showing how genetic factors may interact with learning (conditioning) to produce problem drinking. As Ludwig and Wikler (1974) have pointed out, social and psychological "modifiers" obviously influence the "addictive cycle." For example, studies indicate that alcoholics differ from nonalcoholics in having a dominant mother and a weak, passive father (Barry 1974). There is also evidence that ordinal birth position influences who becomes alcoholic (Barry et al. 1969). A host of other psychological and social modifiers have been described in the alcoholism literature; few would dispute the importance of some or all of these modifiers in promoting or discouraging the hypothetical genetic-conditioning sequence proposed above.

HOW APPLICABLE?

Assuming the above hypothesis has some validity for alcoholism, to what extent can it explain other forms of substance abuse? Attempting to shown common features in alcoholism and drug abuse in general, I will break down the problem into the traditional triad of agent, host, and environment.

AGENT

Commonly abused psychotropic substances have, I propose, some features in common. First, they are short acting, that is, rapidly assimilated and rapidly eliminated. Nicotine perhaps better meets this definition than any other compound widely used and abused today (and some believe nicotine is the most abused of readily available substances).

Historically, phenobarbital, a long-acting drug, was not considered addictive, but with the introduction of short- and intermediate-acting barbiturates in the 1930s, the addiction problem with this class of drugs became quickly apparent. Alcohol (which is rapidly absorbed and eliminated at about the rate of 15 ml per hour), opiates, newer barbiturates and their analogs, amphetamines and other stimulants, and nicotine rank among the most abused substances in the world. There is still some doubt about marijuana, which, if smoked, is rapidly assimilated but has metabolites with very long half-lives. Its abuse potential in Western countries still remains controversial, but all the other drugs listed above have the common feature of being short acting.

HOST

Genetic factors could operate in two ways to increase or decrease the possibility of an individual becoming dependent on a substance or substances.

First, many individuals are "protected" from developing specific substance abuses because they develop aversive physiological and subjective effects from the drug or drugs in small quantities. There are many anecdotal reports of individuals who can never smoke cigarettes, drink alcohol, use sleeping pills, or tolerate amphetamines or opiates, and the reason appears to be genetic. In the case of alcoholism, many millions of people are thus protected; how many are protected from use or abuse of other substances is not known.

A second means by which peak-and-valley drugs, such as those described earlier, may produce dependence in "unprotected" individuals is probably also under genetic control and involves varying degrees of positive reinforcement from the substance followed quickly by aversive effects which can only be relieved by reuse of the substance that produced the reinforcement-aversive sequence in the first place. If, for example, after many years of not smoking, a former chain smoker smokes a cigarette, he or she receives some reinforcing effects. From that point on, however, the need to smoke is based more on a "drug hunger" or craving produced by that first cigarette than it is on a desire to obtain whatever gratification the first cigarette produced. The initial reinforcing effect, by the way, obviously is not the same for all commonly abused substances. The euphoria from amphetamines and cocaine is apparently much stronger than that produced by alcohol, and the reinforcer that drives the cigarette habit clearly is not euphoria.

To recapitulate, a drug of abuse is one that quickly enters and leaves the body, producing aversive effects during the second stage which can only be relieved by reintroduction of the substance (a chocolate bar, a tranquilizer, or even a pipe cannot truly substitute for a cigarette in the chain smoker who has started the addictive cycle).

One last word about the host: However available the agent, and however susceptible the host, it must be remembered that the host is also born with other traits and susceptibilities, and in the intricate byplay of genetic and environmental factors, forces may emerge which oppose or nullify tendencies to use or abuse a particular substance. These countervailing forces must always be taken into account in evaluating individuals at risk.

ENVIRONMENT

There is no question that availability influences use. During Prohibition, hospitalizations for drinking problems and cirrhosis rates dropped precipitously. This was also true during the Second World War in countries like France and England where wine and beer were scarce, expensive, and often rationed. But it is important to note that more is involved than legality and commercial availability. Prices, ages of buyers, prevailing attitudes toward the substance, and a multitude of other factors will influence use.

Interactive Models of Nonmedical Drug Use

Richard L. Gorsuch, Ph.D.

Gorsuch and Butler (1976a,b) developed a multiple-model theory of nonmedical drug use in an attempt to provide relatively concrete and detailed descriptions of factors leading to specific types of nonmedical drug use. The primary focus of the models is on illicit "hard" drug abuse, such as abuse of heroin and cocaine. The models, however, are not restricted solely to "hard" drug abuse but probably apply to the nonmedical use and abuse of several types of substances. The first section below provides the theoretical background for the models' development. The second section outlines the models themselves.

The research upon which the models were based was detailed previously (Gorsuch and Butler 1976a,b) and is not repeated here. While occasional studies will be referenced to illustrate major conclusions, the point of the present paper is to explain the models and their perspectives rather than to review the literature. Other recent research reviews (e.g., Sadava 1975; Jessor 1979) have identified the same empirically established characteristics as we did. Recent research programs have continued to document these conclusions (e.g., Jessor 1976; Nail et al. 1974; Sadava and Forsyth 1977; Kandel 1978b).

ORIGIN AND NATURE OF THE MODELS

PSYCHOLOGICAL

The theory presented here is psychological, focusing upon the individual, with drug behavior as the dependent variable. Groups are important only insofar as they influence the behavior of the members of that group.

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The psychological focus identifies as the major causative factors those which operate directly within the person's life space. Individuals are directly influenced only by internal processes or by that which happens in their immediate environment. Internal processes include physiological processes; the residuals of past experiences, including beliefs, opinions, expectations, attitudes, and values; and psychological processes. Direct environmental influences consist of the objects and events in the immediate environment which actually affect the individual. For example, friends taking drugs when the individual is not present is not a direct influence, but learning about friends taking hard drugs is.

This psychological perspective defines other environmental influences as indirect factors which produce or influence the objects and events in an individual's life space. For example, a law which increases the availability of a particular drug would be an indirect influence, producing the direct influence: the presence of the drug in the person's environment.

MULTIVARIATE

While a simple, one-element theory is widely desired, our own experiences suggest that such univariate theories are seldom appropriate. Many decisions, including those about drugs, are the result of multiple factors. Because of this, we held open the option in developing our models for multiple causative elements, although, following Occam's razor, we did not wish it to be so unless it were necessary.

Multivariate models are basically of two types. The first and most common is the linear model, in which each element is applied equally to everyone. Ordinary statistical analyses operate from this model; for example, one mean is the estimate of the performance of everyone in a particular group. The multivariate linear models of causation give a unique weight to each causative factor, and the prediction for an individual is a function of the weight for that causative factor and the degree to which it is present for that person.

In a second type of multivariate model, it is recognized that different individuals may be influenced by radically different situations, producing different effects on their behavior. Moreover, the same behavior may have totally different causes in different people; what is sufficient cause for one individual to engage in illicit drug use may not be for another. In these situations, simple multiple regression weights, for example, do not apply equally to everyone, and the ordinary statistical procedures of chi-square and ANOVA can be misleading. Instead, several different causative models need to be developed so that the model applied to an individual is the most appropriate for his or her situation. In this theory, each of the different causative models which can lead to the same illicit drug use provides a description of a different path by which a person might proceed to a particular behavior.

The allowance for multiple paths as separate models makes the theory more comprehensive. For example, a path in existence prior to the 1914 Harrison Act may no longer exist because of the impact of that act. But the ability to describe that path within the general theory is important for two reasons. First, only as we are aware of a former path to illicit drug use will we be able to avoid accidentally recreating it. Second, it is possible that there are special groups which, from a psychological perspective, exist today in an atmosphere comparable to that of the general public prior to 1914.

If multiple models are possible, the question of whether one model is the model does not occur. Instead the question is whether a model actually describes a group of people who currently or potentially exist. If so, then that model is important for our total understanding of the phenomena. It is hoped that demographic studies will provide us with descriptions of which models apply to the greatest number of people, but the therapist interested in the drug abuse of a particular client will be concerned with the most appropriate model for that individual rather than the "popularity" of the model in society.

MULTIPLE STAGES

Another characteristic of our theory is the explicit consideration of multiple stages of drug involvement. It does not assume that initial drug use and drug addiction have the same causes. Admittedly, some theories do take a single-stage, "take it once and hooked for life" approach. However, we found the evidence strong that many who do have an initial experience with a particular drug do not become continual users, and that many who become continual users do not become addicts. Hence, the causes for each stage may be different, and a set of stages is necessary. Our stages are initial drug use, continual use, and addiction.

While the paths and the stages are summarized here as discrete and unique, they can be expected to blend more in life than they do on paper. A person may follow only one or may follow many paths to drug use and may even function at intermediate points between the stages. The paths and stages are merely theoretical devices to aid our conceptualization for research and intervention purposes and, so, oversimplify the phenomenon somewhat.

THE MODELS

Each of the three sections below provides a model for how individuals may try a drug for the first time. Each model represents a major and distinct pathway, but it is important to bear in mind that there may be many individuals who wander back and forth between two or more paths.

NONSOCIALIZED DRUG USERS MODEL

One of the more consistently found precursors of illicit drug use is a lack of socialization. Numerous studies have compared the personality characteristics of those who use illicit drugs with those of nonusers. (See Gorsuch and Butler 1976a.) Regardless of the personality scale used, drug abusers are lower on social conformity and social responsibility scales than are nondrug abusers. This is to be expected, for the person without internalized norms against drug abuse is a person who is open to being swayed into drug use by situational factors. As Bowers (1968) showed, those with strong personal norms against it will not use a substance even if the environment allows it, but those without strong norms will fluctuate widely in their usage depending upon the environmental characteristics.

According to our theory, not being socialized to the traditional culture is a necessary but not a sufficient condition for drug abuse. Hence, socialization is expected to be a unidirectional predictor, with the highly socialized not being involved in drug abuse regardless of peer pressure or the availability of the drug, for example, but with the nonsocialized person engaging in use as a function of situational aspects of availability, peer pressure, and so forth.

For the nonsocialized person, peers play a major role in our contemporary culture. The role they play is twofold. First, it is most often through peers that illicit drugs are made available, since these drugs can seldom be purchased through ordinary means. The peer group may either supply the drug directly or provide information on obtaining it. Having a large number of drug-using friends means that the nonsocialized individual has ready access to drugs. Since there is no internal mechanism to prevent drug usage for this person, such ready access leads to the high rate of initial use. This is what gives the peer group the predictive strength often found in research studies (e.g., Johnson 1973).

Second, the peer group may provide models for drug usage, teaching its members when, where, and how to use the drugs. This theory does not, however, require socialization by the peer group into a drug culture for the nonsocialized individual to have the initial drug experience. The effect is more casual than that--the peer group needs only to provide models for attainment and use of the illicit drugs.

The impact of the peer group will differ for different age groups as a function of the amount of time spent within that group and the extent to which it is free of external controls. With children, peer-group activity is almost never free of adult supervision, so there is little availability of drugs for a nonsocialized child. But adolescents often function without supervision, and hence the channels are more open for illicit drug passage.

Parents influence their children, when not actually supervising them, only through the internal standards which they have imparted to them, and with the nonsocialized youth such internal standards are absent. Parents who have not socialized their children regarding drugs have little or no impact on whether the children will have an initial drug experience.

There is some literature to suggest that the absence of the mother or father relates to illicit drug use (Gorsuch and Butler 1976a), and this is probably true because such absences sometimes disrupt the socialization patterns. However, the fact that this effect is not always found is not surprising, because the major variable should be the parenting, not the presence of a particular biological parent. The literature does indeed suggest that parental relationships are poorer among those abusing drugs than among those not abusing drugs. Unfortunately the literature is incomplete, and it is difficult to decipher whether this phenomenon is a result of a lack of proper parenting or a reaction of the parents to a child who is nonsocializable, if such a child exists.

Religious membership has been included in more research studies than almost any other variable and has a highly consistent ability to predict the nondrug user (Gorsuch and Butler 1976a). Unfortunately there has been only one article specifically concerned with the impact of religion (Linden and Currie 1977), so the "why" behind this relationship is just beginning to be explored. In the nonsocialized model, religious membership theoretically could be expected to operate in three ways. First, membership in a religious body indicates that the parenting figures have themselves been a part of and support traditional socialization and can be expected to pass such norms on to their children. Second, participation in a traditional group would provide for substitute parenting figures if the biological parents were incapable of or unwilling to provide appropriate models and traditional socialization. Third, the religious membership provides a peer group whose members are more likely to be traditionally socialized and supportive of traditional socialization. Such a peer group would be unlikely to make illicit drugs available to the nonsocialized individual. And since nonsocialized individuals have no particular drive for drugs per se, they will fit in with and conform to a nondrug-using subculture just as well as a drug-using subculture.

PRODRUG SOCIALIZATION MODEL

It is often the case that a person is socialized into a prodrug lifestyle. Some of the clearest examples of this can be found in certain Native American tribes or religious or quasi-religious groups that use drugs for ceremonial or other such purposes. The socialization need not be to illicit drugs. A widely replicated finding in the research literature is that children who use a drug illicitly often come from families where one or more of the parenting figures used drugs. Even though parenting figures generally used licit drugs--over-the-counter drugs and tranquilizers prescribed by doctors--the effect was to teach their children that drugs are good and provide a solution for one's problems. It is a small step from buying drugs at the corner drug store to buying drugs on the corner.

The parents described by this model are prodrug socializing forces. Because they are highly respected by and spend more time with their children, the youths are likely also to be prodrug and hence to use drugs, whether licit or illicit. Note that this model does not describe parents who teach moderate or prescribed usage of drugs.

Peers are another source of prodrug socialization. The extent to which encouragement and active solicitation by peers actually occurs is currently debated, for there are counterarguments that the illicit drug subculture, which developed because of common needs for drugs, does not engage actively in socializing others into the culture. Despite the fact that the degree to which this occurs is unknown, it is apparent that it can occur, at least in some cases, and so must be included in the general model.

In addition to socialization regarding drugs per se, socialization into a set of "sympathetic" personality characteristics may be also important in this model. It is commonly found that the nontraditional values of individualism and experimentation, as well as the American "left wing" value systems, are predisposing to the use of illicit drugs in that they provide a set of attitudes and values that encourage the type of experiments that can include illicit drug use.

The model assumes that there are prodrug socializing agents in the individual's immediate environment that provide relatively easy access to illicit drugs, numerous opportunities for drugs to be used, and models for their use. With such a background, the motivation need not be strong for an initial drug experience to occur. The normal drive in children and youths simply to try whatever they see others doing is sufficient to account for the actual initial drug experience. To the extent that motivation plays any part in this scheme, the major motivating factors would be the need for status (e.g., to be "adult"), novelty seeking, curiosity, relief from boredom, and a motivation unique to this particular model: conformity.

IATROGENIC MODEL

The origin of the iatrogenic model is found in the initial use of opium and its derivatives for medical purposes before 1900. For many years the addictive properties of such drugs were not understood, and people unknowingly became addicted to these drugs which were used for medical purposes.

In this model the primary motivation for the initial illicit drug use is the relief of physical pain or mental anguish. A person will seek out a drug not when life is going well--as could occur for the nonsocialized or prodrug socialized individual--but when life is going poorly. The fact that many individuals who try drugs illicitly have already undergone use of similar drugs in hospital settings suggests that they may be influenced by the success of the medical use of these drugs, and perceive illicit drug use as a simple extension of common medical procedures "without bothering the doctor."

Physicians and other medical workers have a considerably higher illicit drug use rate than the normal population. The iatrogenic model stresses the fact that these are the people who see on a day-by-day basis the positive uses of drugs for medical reasons and hence may succumb to the temptation to self-prescribe.

An Existential Theory of Drug Dependence

George B. Greaves, Ph.D.

Existential psychology deals primarily with the phenomenal and emotional state of individuals, with a person's experience of the quality and meaning of his or her life, and of means and methods of therapeutic intervention, both verbal and nonverbal, which can lead to an enhancement of an individual's life state. Within the framework of existential theory, human beings are seen to be motivated primarily to satisfy and sustain basic needs and to fulfill certain aspirations (Maslow 1954). The payoff for such satisfaction and fulfillment is a sense of personal wholeness and well being (Maslow 1962; Rogers 1962). The failure to secure basic needs and self-enhancing aspirations leads to a sense of dis-ease and despair, which, in turn, gives rise to activities, both destructive and productive, aimed at reducing such dis-ease and despair. My existential theory represents an attempt to understand and account for destructive patterns of drug use within the framework of existential psychology (Greaves 1974).

Ever since the 1920s, clinicians and researchers studying drug-dependent and drug-dysfunctional persons have commented on the pathological personality patterns of such individuals and have offered various taxonomies to describe the range of personality disorders seen. This line of speculation received a major boost with the publication of Pescor's work in 1943, based on a very large sample of drug-addicted persons at the then new Federal narcotics rehabilitation center in Lexington (Pescor 1943a).

The prevailing impression one gathers from a reading of this literature is that certain individuals, as a result of aberrant or unhealthy personalities, represent high risks for drug dependency if they are exposed to certain psychoactive drugs. In other words, in any N sample of individuals under identical stimulus conditions, there is not an equal chance that any given individual will become or remain drug dependent. Rather, there are systematic and identifiable personality factors which interact with the drug-taking behavior that leads to dependency. This apparent phenomenon has traditionally been called "addiction proneness" (Gendreau and Gendreau 1970).

Critics of the notion of addiction proneness have argued that the very methods which drug researchers have used have guaranteed the results. Thus, the kinds of people who wind up in prisons, hospitals, and drug programs to be available for study are exactly those who have a higher incidence of aberrant personality traits: the young, the minorities, the poor. But later studies which have tapped other samples, and studies using matched-sample control groups, have tended to quiet the critics. Among physician addicts, for instance, the familiar elevation in the psychopathic deviancy scale of the Minnesota Multiphasic Personality Inventory (MMPI) was found, as in other addicts, although such an elevation in the Pd scale is not typical of physicians in general. Similarly, I found that middle-class adolescents who were drug dependent resembled other adolescents who were hospitalized in a psychiatric hospital but were very unlike their adolescent peers residing in the same city (Greaves 1971).

Those researchers currently working within the area of addiction proneness are no longer content to document addiction proneness but are now working on specifying the personality variables at work in specific kinds of addictions, usually defined in terms of the abuser's drug of choice. Major distinctions have been drawn, for instance, between the personalities of those who prefer heroin and those who prefer amphetamines or barbiturates as drugs of dependency (Greaves, in press; Milkman and Frosch 1973).

Although I have been one of the contributors to the literature on one's drug of choice as a function of personality variables, my main interest has remained with the general phenomenon of addiction proneness. For a clue as to why persons come to abuse drugs, I first turned to the phenomenon of mind-altering or mood-altering drug-use behavior, of which abuse is an extension.

William James was the first to state explicitly and explore the existence of altered states of consciousness within the Western phenomenalist tradition. Writing in the Principles of Psychology, James observes:

> Our normal consciousness, rational consciousness as we call it, is but one special type of consciousness, whilst all about it, parted from it by the flimsiest of screens, there lie potential forms of consciousness entirely different.
>
> (James 1890)

While James fell short of stating that individuals have an innate drive to experience these altered states, he did state that the popularity of alcohol derived from its ability to stimulate such states:

> It is the power of alcohol to stimulate the mystical consciousness that has made it such an important substance in man's history.
>
> (James 1907)

It remained for Andrew Weil, another Harvard physician, to state James' hypothesis explicitly:

> It is my belief that the desire to alter consciousness periodically is an innate, normal drive analogous to hunger or the sexual drive.
>
> (Weil 1972)

If James' hypothesis is true--that there are naturally existing alternative states of consciousness, and it seems almost certain that there are--then several hypotheses seem readily to follow:

1. Such alternative states serve an adaptive purpose to the organism.
2. It is natural to pursue such states (Weil 1972).
3. Children, due to their relative lack of rational enculturation, are more readily in touch with some of these states (Fraiberg 1959; Weil 1972).
4. The use of drugs is one way to facilitate access to these states (Weil 1972).

I would further hypothesize that--

1. Some adolescents and adults are less able to access altered states of consciousness due tc intervening anxiety states and other pathological states;
2. Such persons make use of drugs beyond the motive of accessing such states, using them rather to restore themselves to a state of being by which they are able to access both usual and alternate states;
3. The taking of drugs in an attempt to rectify an abnormal state of personality is a form of automedication, and forms the cornerstone of all drug dependency; and
4. If persons could access altered states to a more normal degree, i.e., in the ways persons with normal personalities do, they might use drugs, but would not abuse (be dependent on) them.

The automedication hypothesis is, of course, not new (Wahl 1967). Alcoholics have been thought by many to be "treating" themselves chemically for depression, heroin addicts have been described as "numbing" emotional pain, and so forth.

What characterizes the theory proposed here is the specific range of variables believed to lie at the personality and emotional core of all substance abusers. These variables were derived from three sets of empirical observations. As originally set forth, these were as follows:

> The first observation is that drug-dependent persons seem to have fundamentally disturbed sex lives. They are frigid, impotent, indifferent, prudish, angry, or resentful concerning sex. Whatever their particular disturbance, sex is not a great or reliable source of pleasure. For many it is frankly dysphoric. Furthermore, this lack of sexual enjoyment seems to predate the period of drug dependence and is certainly aggravated by drug use. Among humans, I have come to suspect that drug dependence does not supersede sexual pleasure--it replaces it (Bell and Trethowan 1961).
> (Greaves 1972)
>
> The second of my observations has been that drug-dependent persons as a group do not know how to play--at least not without their drug. Very few things hold interest in the

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> straight world; almost nothing is seen as exciting. They often appear jaded and disinterested in anything around them that does not directly relate to the drug life style. They have lost contact with their natural child within them, and with it their spontaneity, creativity, and joy.
>
> The third observation, and this may be the primary factor on which the other two are based, is that drug-dependent persons seem to be remarkably out of touch with pleasurable somatic feedback. Alcohol-dependent persons are observed to drink massively more alcohol than nondependent persons as a function of their blocking the pleasurable effects of alcohol in low doses. Because of this, they are less able to pace themselves as drinkers. Whether this lack of somatic feedback is due to some physiological deficiency which requires higher dosages of the drug to obtain arousal, or whether there are specific psychodynamics at work is another moot point, but an empirical one. My own work strongly suggests that there are chiefly psychological and attitudinal factors at work. Whatever the case, if persons who are drug dependent, or who become drug dependent, are, indeed, out of touch with primary somatic feedback which other people would experience as pleasure, this may be the reason that they do not enjoy sex or play--there is simply nothing in it for them.
>
> (Greaves 1974)

In summary, "persons who become drug dependent are those who are markedly lacking in pleasurable sensory awareness, who have lost the child-like ability to create natural euphoria through active play, including recreational sex, and who, upon experimentation with drugs, tend to employ these agents in large quantities as a passive means of euphoria, or at least as a means of removing some of the pain and anxiety attending a humorless, dysphoric life style" (Greaves 1974).

Based on this work and subsequent clinical experience which tends to confirm it, I have been an outspoken critic of drug-treatment programs based on asceticism, privation, and harsh behavioral treatment. Such programs, by their nature, tend to promote dependence on passive forms of euphoria, undermining the very purpose for which they were allegedly designed. As originally put:

> The therapeutic implications of this present set of contentions are clear. If we are to minimize drug dependence, we need to teach drug-dependent persons to turn themselves on as a substitute for the euphoria-producing properties of drugs, and to relax in order to replace the anxiety-reducing effects of drugs. The reason our present methods of treating drug dependence are failing so miserably is that we are both making unreasonable demands on our clients and focusing on the wrong things. Our major unreasonable demand is that we want a person to give up something that gives him pleasure and/or relieves distress, while offering little in return except vague, distant promises of a better life and improved self-esteem. As to focusing on the wrong things, we are headed in precisely the wrong direction in drug programming: toward asceticism, which emphasizes good behavior and de-emphasizes the importance of pleasurable feelings, thus unwittingly encouraging passive-dependence on chemical

> sources of pleasure; and away from humanism, which emphasizes the importance of pleasurable experience and is suspicious of passive-dependence on drugs. We seem to have drawn the absolutely backward conclusion about the drug addicted person that he is an actively hedonistic, pleasure-seeking, turn-on freak when he never was that. What he was and is is a chronically uptight individual who experiences great difficulty securing his need for pleasure in ways that others do.
>
> We emphasize the importance of the drug dependent person's acquiring a job as a condition of his rehabilitation, when very little evidence supports the contention that having a job is a decisive element in successful withdrawal from drugs. Instead of conceiving of drugs as the enemy and seeing drug abstinence as a great struggle against the enemy, to be hopefully brought about through great striving and strictly regimented behavior, we need to adopt a human growth and need-fulfillment model. We need to help persons to become the agents of their pleasure, not the passive recipients. We need to provide body-sensory awareness programs, meditation, expressive art therapy, psychotherapy. We need to turn our clients on to music, dancing, fishing, camping, boating, photography, and sex. . . . We need to help clients to realize that not only is it all right to pursue actively a wide range of pleasurable experiences, but how to. Yet none of the five major treatment modalities overviewed by Ball (1972)--a) detoxification, b) maintenance, c) individual and group psychotherapy, d) therapeutic communities, and e) religious communities--effectively, in and of themselves, come to grips with the dysphoric underlay of drug dependence.[1]
>
> (Greaves 1974)

During the past several years, drug abuse treatment programers, using these and other ideas, have placed increasing emphasis on "alternatives" to drug-abusing behavior. The jury is still out as regards the outcome benefits of this approach, though preliminary results are encouraging.

SPECIAL POPULATIONS

As a general theory of drug dependence, the existential theory does not deal with special risk populations except to comment that inherent in special subpopulations are the factors that give rise to personality maldevelopment, situational stress pathology, or unusual opportunity (such as availability or peer support), which give rise to abuse.

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[1] Reprinted with permission from G. Greaves, "Toward an Existential Theory of Drug Dependence," Journal of Nervous and Mental Disease, 159(1974):263-274. Copyright © 1974 by The Williams & Wilkins Co., Baltimore, Md.

An Ego/Self Theory of Substance Dependence

A Contemporary Psychoanalytic Perspective

Edward J. Khantzian, M.D.

INTRODUCTION

Drug dependence is tied intimately to an individual's attempt to cope with his or her internal emotional and external social and physical environment. Viewed from a contemporary psychoanalytic perspective, drug dependency can best be understood by examining how such a person's ego organization and sense of self serve or fail the individual's attempts to cope, and how the specific effects of various substances facilitate or impede such attempts.

Although early psychoanalytic investigators appreciated the presence of underlying depression, tension, and distress in addicts, most of the early psychoanalytic formulations of substance dependence emphasized the instinctive, pleasurable aspects of drug use to explain the compelling nature of addiction (Yorke 1970; Khantzian 1974; Khantzian and Treece 1977). More recent psychoanalytic formulations have placed greater emphasis on problems in adaptation, ego and self disturbances, and related psychopathology as etiological factors in drug dependence (Krystal and Raskin 1970; Wurmser 1974; and Khantzian 1978).

A variety of drug-use patterns and degrees of dependence in which everyday problems of living are involved may be identified (Khantzian et al. 1974). Nevertheless, I have become convinced, as has Wurmser (1974), that becoming and remaining addicted to drugs is in most instances associated with severe and significant psychopathology. Necessarily, some of the observed pathology evident in addicts is the result of drug use and its attendant interpersonal involvements (Zinberg 1975; Mirin et al. 1976; Khantzian and Treece 1979). However, it is my opinion that drug-dependent individuals are predisposed to use and to become dependent upon their substances mainly as a result of severe ego impairments and disturbances in the sense of self, involving difficulties with drive and affect defense, self-care, dependency, and need satisfaction. Hence, my theoretical work has focused on these impairments and disturbances in the ego and the sense of self.

ADAPTATION AND DRUG USE

In one of our first papers on substance dependence (Khantzian et al. 1974), we explored the relationship of heroin use to a range of human problems, including pain, stress, and dysphoria. In attempting to adapt to one's emotions and environment, the powerful action of heroin and immersion in the attendant rituals and subculture could be used to mute, extinguish, and avoid a range of feelings and emotions. That is, rather than settling for more ordinary defensive, neurotic, characterological, or other adaptive mechanisms as a way of dealing with distress, heroin addicts had adopted a more extraordinary solution by using a powerful drug and immersing themselves in the associated rituals, practices, and pseudoculture. In this early report, we stressed the costly consequences of the heroin involvement and why the addict was so desperately dependent on the drug, that is, "the central problem for most people who have become addicted to opiates is that they have failed to develop effective symptomatic, characterologic, or other adaptive solutions in response to developmental crises, stress, deprivation, and other forms of emotional pain which may not in themselves be extraordinary. Their response has been to revert repeatedly to the use of opiates as an all powerful device, thereby precluding other solutions that would normally develop and that might better sustain them" (p. 164).

AGGRESSION AND HEROIN DEPENDENCE

In contrast to a general sense that heroin could be used to deal with a range of human emotions and troubles, I also quickly became impressed with a rather specific reason why opiates could be so appealing to many heroin addicts. From the outset of my clinical-investigative work with drug dependency, I was immediately impressed with the enormous, lifelong difficulties heroin addicts had with feelings and impulses associated with aggression. In repeated life histories obtained from addicts, I was impressed with how dysphoric feelings associated with anger, rage, and restlessness were relieved in the short term by heroin and other opiates. This was even more apparent when observing addicts in treatment as they became stabilized on methadone and their aggression and restlessness subsided. I began to suspect that heroin addicts might be using opiates specifically as an antiaggression drug.

As a result of these initial impressions, I published a preliminary report (1972) and subsequently expanded and formulated a hypothesis (Khantzian 1974) which proposed that problems with aggression predisposed certain individuals to opiate dependence and was central in the development and maintenance of an addiction. I emphasized how addicts took advantage of the antiaggression action of opiates in the service of drive defense. I stressed the disorganizing influence of aggression on ego functions in individuals whose ego stability was already subject to dysfunction and impairment as a result of developmental arrest or regression. I also proposed that the same but sustained, longer antiaggression action of methadone was the basis for "success" of methadone maintenance.

SELF (NARCISSISTIC) PATHOLOGY

Over the past decade, considerable attention has been focused on self pathology. In contrast to ego pathology, in which the emphasis is on disturbance in structure and function in coping with drives and emotions, self pathology relates more to troubled attitudes and experiences about the self and others. Kohut (1971) and Kernberg (1975) have explored how disruptions and disturbances in a person's early development, particularly around nurturance and dependency needs, lead to self pathology in adult life. Both investigators consider substance dependencies as manifestations of such disorders, although neither Kohut nor Kernberg has systematically explored this relationship. A number of investigators have attempted to relate this recent better understanding of narcissistic processes and disturbances to substance dependence. Reports by Wieder and Kaplan (1969), Wurmser (1974), and Krystal and Raskin (1970) have stressed narcissistic vulnerabilities and decompensation as predisposing factors. Wurmser, in particular, has emphasized how drugs are used to counteract the distress and dysphoria associated with decompensated narcissistic states.

In my own psychotherapeutic work with addicts, I became interested in some of the unique and characteristic traits of compensated addicts (i.e., addicts who were either drug free or on drug maintenance) that are related to underlying narcissistic processes and disturbances, and how such traits might predispose an individual to drug dependence. I repeatedly observed the addict's special problems in accepting dependency and actively acknowledging and pursuing goals and satisfactions related to needs and wants. Extreme and alternating patterns in pursuing need satisfaction were evident: Cooperation and compliance might suddenly alternate with outbursts of rage, refusal, or resistance; passivity and indifference could shift rapidly or coexist with active, intense, and restless involvements that often led to danger, violence, and death; disavowal of needs and solicitousness of others might suddenly convert to angry demands and an entitlement that was totally oblivious of other people.

To explain such patterns, I proposed that the rigid character traits and alternating defenses employed by addicts were adopted against underlying needs and dependency in order to maintain a costly psychological equilibrium. Prominent defenses and traits included extreme repression, disavowal, self-sufficiency, activity, and assumption of aggressive attitudes. I concluded that "defenses (and the associated character traits) are employed in the service of containing a whole range of longings and aspirations, but particularly those related to dependency and nurturance needs. It is because of massive repression of these needs that such individuals feel cut off, hollow and empty . . . [and that the] . . . addicts' inability to acknowledge and pursue actively their needs to be admired, and to love and be loved, leave them vulnerable to reversion to narcotics" (Khantzian 1978, p. 196).

SELF-SELECTION AND THE SPECIFIC APPEAL OF HEROIN

Most substance-dependent individuals prefer and self-select a particular drug. This preference and selection is the result of the drug of choice and its distinctive psychopharmacologic effects interacting with the unique personality organization and reactive patterns of an individual. It is this interaction between drug effect and personality organization that predisposes a person to dependency on a particular drug. The specific appeal of opiates, stimulants, sedative-hypnotic drugs (including alcohol), and other drugs has been explored from a psychodynamic perspective (Wieder and Kaplan 1969; Wurmser 1974; Milkman and Frosch 1973; Khantzian 1975). Wieder and Kaplan, and others, continue to stress the regressive and pleasurable ego states produced by these drugs (including opiates) to explain their appeal, while Wurmser and I have placed greater emphasis on the progressive and adaptive use of drugs. In this respect, I have been particularly interested in the narcotic addict's preference for opiates. As already indicated, my early work with heroin addicts led me to conclude that the compelling nature of opiates for many narcotic addicts resides in a specific antiaggression action of narcotics, namely, to relieve and counteract regressed, disorganized, and dysphoric ego states related to overwhelming feelings of rage, anger, and related depression. Whereas the use of drugs such as the amphetamines and hypnotics (including alcohol) results in the mobilization and expression of aggressive and sexual impulses, opiates have the opposite effect. This effect is particularly needed and welcomed in certain individuals whose ego mechanisms of defense, particularly against aggressive drives, are shaky or absent. On close examination, we have been impressed repeatedly that the so-called "high" or euphoria produced by opiates is more correctly a relief of dysphoria associated with unmitigated aggression. The short-term effect of the drug is to reverse regressed dysphoric ego states by muting and containing otherwise uncontrollable rage and aggression (Khantzian 1972, 1974, 1978).

SELF-CARE DISTURBANCES

The previous sections have focused on how drug addicts attempt to use drugs adaptively to overcome and cope with ego and self problems. In this final section I would like to focus on a more obvious maladaptive aspect of drug use.

The influences of early psychoanalysis are evident in "id" formulations of addictions that invoke and presuppose the existence of unconscious death wishes and self-destructive trends (death instincts) to account for the destructiveness and dangers associated with drug dependence. Clearly, certain individuals are driven or are compelled to be self-destructive, with suicide the most extreme manifestation of such a compulsion. Indeed, it has been suggested rather cynically by some that drug dependence and abuse is a form of suicide on the installment plan. Menninger (1938) is representative in presenting such a point of view, referring to such behavior as "chronic suicide." The psychology of conscious and unconscious human destructiveness is complex and may well be a component in the destructive aspects of substance dependence. However, in my experience, many of the self-destructive aspects of drug dependence represent failures in ego functions involving self-care and self-protection.

Self-care functions originate and are established in early phases of human development. They become internalized as a result of and through the ministrations of the caring and protective role of the parents, particularly the mother. If optimal, children gradually incorporate a capacity to care for themselves and to protect against and anticipate harm and danger. Extremes of indulgence and deprivation may do injury to the individual's developing ego and sense of self around vital functions of self-preservation and care, and may leave individuals vulnerable to a whole range of hazards and dangers, not the least of which is the use of dangerous drugs.

Self-care as an ego function is complex. It is probably the result of a number of component functions and defenses such as signal anxiety, reality testing, judgment, control, and synthesis, and when impaired, such defenses as denial, justification, projection, etc. We are all subject to our instincts, drives, and impulses, and if they are expressed indiscriminately, we are subject to hazard and danger. Most of us check ourselves more or less and automatically exercise caution, or we are appropriately worried and fearful of the prospects of danger or hazardous involvements. Such checking or cautionary responses are an integral part of our ego mechanisms of defense. However, it is exactly in this regard that addicts are deficient in their ego.

> These are problems that I consider to be related to self-care (ego) functions that are impaired, deficient or absent in so many of the addicts we see. The problems with self-care and regulation are apparent in their past histories (predating their addiction) by a high incidence of preventable medical and dental problems, accidents, fights, violent behavior and delinquent behavioral problems. Their impaired self-care functions are also evident in relation to their drug/alcohol problems, where despite obvious deterioration and imminent danger as a result of their substance use, there is little evidence of fear, anxiety or realistic assessment about their substance involvement. One might correctly argue that in this latter instance, the lack of self-care is secondary to regression as a result of prolonged substance use. Although this is probably true, we have been impressed with the presence and persistence of these described tendencies in such individuals both prior to becoming addicted and subsequent to becoming detoxified and stabilized."
>
> (Khantzian 1978, p. 193)

A General Theory of Addiction to Opiate-Type Drugs

Alfred R. Lindesmith, Ph.D.

I formulated my theory of addiction on the basis of an investigation done in Chicago during the years 1934-35 by, at first, observing and interviewing Chicago street addicts. Approximately 50 addicts were interviewed repeatedly over a period of a number of months, and some others were contacted only once or a few times. I did not consult the literature on the subject until I had developed a preliminary hypothesis.

Theories prevalent at the time were generally unsatisfactory, seeming to reflect the ideological commitments and training of their authors rather than the evidence. Most claimed to apply only to limited populations, making it impossible to prove them false by citing negative evidence since such instances were written off in advance. I began my study with the assumption that a scientific theory of addiction ought to be generally applicable regardless of whether the addict was a physician, a medical patient, or a street derelict from the urban slums. It also was assumed that the theory should be applicable no matter how the drug was taken and that it should apply to addiction in earlier centuries and in countries other than the United States.

After I entertained a few preliminary hypotheses and rejected them when negative evidence was found, I reached a conclusion concerning the dominant and basic characteristics of addiction--the causal process that produces the powerful craving for opiates. When I sought negative evidence or exceptions to this conclusion and its implications, I failed to find them. Instead, it seemed to me that the theory made sense of what had at first seemed like a chaotic jigsaw puzzle filled with paradoxes and inconsistencies.

In brief, the theory I formulated is that opiate drug users develop the craving, or become addicted or "hooked," after physical dependence has been established, in the process of using the drug to alleviate the withdrawal distress that begins to appear several hours after the last dose, provided that the user correctly identifies and understands these symptoms (Lindesmith 1947).

After I had formulated this hypothesis and was checking and working out its implications in interviews with users and by consulting the scientific literature, I stumbled on the same conclusion stated by a prominent German investigator, A. Erlenmeyer, in 1926. (See references.) Being interested mainly in physiological aspects and the medical treatment of addicts, Erlenmeyer did not develop this statement in detail as a theory but simply stated it as a fact and passed on to other matters.

Noting and documenting the organic effects that occur as morphine is used on a regular daily basis, Erlenmeyer describes the process as a "reversal." He adds:

> The morphine originally foreign to the body, becomes an intrinsic part of the body, as the union between it and the brain cells keeps growing stronger; it then acquires the significance and efffectiveness of a heart tonic, of an indispensable element of nutrition and subsistence, of a means for carrying on the business of the entire organism. . . .
> (Cited in Terry and Pellens 1928, pp. 601-602)

He describes the withdrawal syndrome that occurs after the reversal of effects has taken place as a "host of painful sensations, intolerable feelings, oppressive organic disturbances of every sort, combined with an extreme psychic excitement, intense restlessness, and persistent insomnia." He then remarks:

> In such moments the craving for morphine is born and rapidly becomes insatiable, because the patient has learned that these terrible symptoms are banished as if by magic by a sufficiently large dose of morphine.
> (Cited in Terry and Pellens 1928, pp. 601-602)

The cognitive feature of my theory, which is also implicit in Erlenmeyer's statement, is designed to explain how it happens that medical patients relatively rarely become addicted even when opiates are administered on a regular daily basis for prolonged periods sufficient to establish physical dependence. It is widely recognized in medical practice that in the administration of such addicting drugs, keeping patients in ignorance or deceiving them about the identity of the drug are effective tactics in preventing subsequent use. If withdrawal symptoms occur, they may be explained to the patient as symptoms of a disease, as side-effects of other medication, and so on. If a patient who has been attracted to the effects of morphine that has been regularly administered is deceived into the belief that the drug was strychnine or arsenic, he or she will lose interest in it.

Similar considerations also apply to the fact that physical dependence in very young children, such as occurs in infants born of addicted mothers, apparently never produces addiction. In India, a lower caste custom that involved keeping very young children quiet by providing them with opium often produced physical dependence. The drug was usually withdrawn by the age of five. No addiction appears to have resulted from this practice, and there was no connection observed between it and adult use.

An important and often overlooked aspect of opiate effects that is basic to the theory and that is strongly emphasized by Erlenmeyer is the changes in these effects that take place gradually during the progression from initial use on a regular basis to the point of physical dependence. Disregarding a few unpleasant effects following from the first

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few doses, initial effects may be described as depressant and are perceived by the recipient as generally pleasant in that they relieve pain and discomfort and produce a feeling of relaxation and well being.

It is these first effects and the impact of a dose that are spoken of as the "high" or "rush" by addicts. As usage continues, these euphoric effects become progressively briefer in duration and harder to obtain. The original sedative effect gives way to and is replaced by an opposite or stimulating effect as the drug begins gradually to be used mainly to alleviate withdrawal distress. Organic changes are of a parallel nature. The first injection creates abnormal bodily changes which tend to return to normal as bodily adaptation occurs. When the latter process is complete, bodily abnormalities occur when the drug is withdrawn and return roughly to "normal" when another dose is taken. In this situation the user feels approximately normal between shots but still has the solace of brief euphoric episodes at the time of injection, these becoming progressively more difficult to achieve as use continues.

This reversal of effects creates some important logical problems and paradoxes for the theorist. If initial euphoric effects are said to be the key factor, one may ask why addicts seem so miserable and so prone to suicide. If euphoria is the addict's goal, an obvious way to maximize it would be to stop regular use and, instead, use the drug episodically--say, every other day. This would unquestionably reduce costs, risks, and misery generally and would also permit the user to enjoy the "high" for considerably longer time periods. One might also wonder why, after the user has experienced the miseries and frustrations of addiction, she or he does not kick the habit and take up a euphoria-producing drug that does not produce physical dependence, like cocaine or marijuana.

Since the proposed theory does not view the euphoric effects of opiates as the key factor in addiction, these considerations are not an embarrassment to it. From this standpoint one may describe the initial period of use as the stage at which the user learns to like the drug, and subsequent use, to control withdrawal after the reversal of initial effects, as the stage in which she or he learns to love it.

The proposed theory has been corroborated in a variety of ways which cannot all be dealt with here. Two of these will be briefly indicated.

Since there are addicts who have become physically dependent on an opiate before the sequence of regular use that made them addicts, it is relevant to the theory to ask how they escaped addiction in their earlier experience. The theory implies that they must have been ignorant of what was happening to them, and this was borne out in every instance of this sort that came to my attention from interviews or from the literature. One such addict simply said, "I was hooked and didn't know it."

The second corroboration, of a partial nature, has to do with the fact that, if one deletes the cognitive feature of the theory, it may be called one of negative reinforcement and fitted into the pattern of conditioning and reinforcement theory of psychology. It was adapted in this way by an experimental psychologist and tested with rats (Nichols 1963, 1965). It was confirmed in the sense that rats that were made physically dependent on morphine by being compelled to drink a morphine solution with a bitter taste became attached to this drink only when they were permitted to experience relief from withdrawal distress after drinking it. These rats also chose the bitter morphine drink in preference to pure water often enough after they had become abstinent to reestablish physical dependence. All of the other rats that had been physically dependent on morphine but had had no experience with the relief from withdrawal retained a very strong dislike for the water laced with morphine.

These findings raise a host of complex issues concerning the differences between human beings and lower animals that cannot be covered here. They illustrate that the theory is experimental and could probably be tested and improved through experimentation with human subjects if this were permissible.

Theory of Drug Use

Harvey Milkman, Ph.D.
William Frosch, M.D.

This theoretical approach is based on the formulation that disturbances in the normally expected mastery of phase-specific conflicts during early childhood may induce severe "primitive" psychopathologies, the addictions being prominent among these. Failure to cope adequately with the rage, overstimulation, and disorganized sensory input of such experiences leaves residual sensory overload and disorganization. The drug user is hypothesized to achieve relief via the specific altered ego states induced by psychotropic drugs. The drug of choice will be the pharmacologic agent that proves harmonious with the user's characteristic mode of reducing stress.

Having once experienced the gratification of a supportive, drug-induced pattern of ego functioning, the user may attempt to repeat this uniquely satisfying experience for defensive purposes, as a solution to conflict, or for primary delight. The compulsion to seek out repeatedly a special ego state will be related to the individual's previous needs for the resolution of conflict or anxiety. If a particular drug-induced ego state provides a mechanism for easing the discomfort of conflict, an individual may seek out that particular drug when that conflict is reexperienced. Wikler's formulations regarding the selection of stimulants, depressants, and hallucinogens closely parallel our own, i.e., chosen substance is related to style of coping with anxiety or stress.[1] The user's drug of choice appears to produce an altered ego state which is reminiscent of and may recapture specific phases of early child development (e.g., heroin, first year; amphetamine, second to third year).

EMPIRICAL FINDINGS

We have provided empirical support for this theory through the controlled investigation of ego functions in users of heroin or amphetamine.

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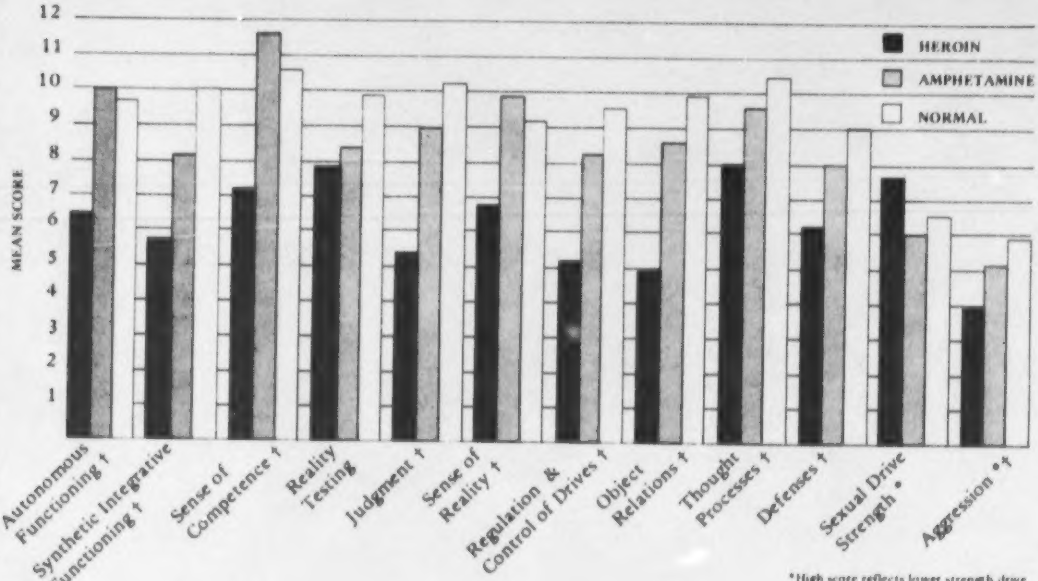
[1] A. Wikler. Personal communication (cited in Blachly 1970).

Using Bellak et al.'s (1973) interview and rating scale for ego functioning, "preferential" users of heroin (N=10) or amphetamine (N=10) were interviewed under conditions of abstinence and intoxication with their respectively chosen drugs. Normals (N=10) were interviewed twice while abstinent. Data were analyzed qualitatively and quantitatively to answer--(a) How do preferential users differ from normals and each other under abstinent conditions? (b) How do they differ under conditions of intoxication? (c) How does the drug user differ within himself under conditions of abstinence and intoxication? Subjects were white, male, middle class, 20 to 30 years of age, and nonpsychotic. Dose levels were 15 mg morphine, intramuscular, and 30 mg amphetamine, oral. The purposeful decision to study preferential users of widely disparate pharmacologic agents highlighted differential personality structures as well as basic similarities. Although our observations and findings derive from our low-dose study of preferential users of heroin and amphetamine, similar investigations could examine the preferential use of other psychoactive agents, e.g., barbiturates and hallucinogens. For the purposes of this presentation, we will discuss only a portion of our empirical findings. The full data are available elsewhere (Milkman and Frosch 1973; Frosch and Milkman 1977).

Under the abstinent condition, both drug-using populations showed subnormal ego-function ratings in most categories (figure 1). Amphetamine users showed significantly higher total ego strength than heroin users, whether or not they were intoxicated. Within groups, ego functioning was usually lower in the intoxicated condition with significant differences observed for judgment (amphetamine), regulation and control of drives (both groups), and sense of competence (heroin). Although ego functioning is more adaptive in amphetamine users when both groups are in the intoxicated condition, one cannot, unequivocally, extend this finding beyond the laboratory situation. Experimental doses of 30 mg and 15 mg for amphetamine and heroin users, respectively, may not be comparable in effect to average "field" doses of 310 mg and 100 mg. Even at our reduced doses, however, the results suggest a trend, in both groups, for ego functioning to be negatively affected by the utilization of their respective drugs. It is expected that under conditions of higher doses, greater impairment of ego functioning may be observed and more significance obtained. Differential description of selected ego functions are provided below.

Regulation and control of drives, affects, and impulses refers to the directness of impulse expression and the effectiveness of delay and control mechanisms; the degree of frustration tolerance; and the extent to which drive derivatives are channeled through ideation, affective expression, and manifest behavior. Both groups display significantly less regulation and control of drives, affects, and impulses in the intoxicated condition. The significant drug effect for this function is particularly interesting because it suggests that under intoxication both groups might be expected to have less impulse control and present a greater danger to themselves and/or the community. The heroin user appears as an individual given to sporadic rages, tantrums, or binges. Periods of overcontrol may alternate with flurries of impulsive breakthroughs. This may be observed dramatically when the user voluntarily submits himself to extended periods of increased environmental structure, in drug programs, where impulse expression is minimized. Temporarily the user appears to have adequate impulse control. Suddenly and without warning, however, impulses gain the upper hand and the user is seen on a self-destructive binge. Disciplinary action is taken and once again impulses are quieted through

FIGURE 1.–***Mean ego function rating for amphetamine S's, heroin S's, and normals in the abstinent condition with ratings for sexual and aggressive drive strengths***



*High score reflects lower strength drive
†$p < .05$ (amphetamine vs. heroin)

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self-regulation, authority, and peer pressures. The cycle tends to repeat.

For the amphetamine user, impulse expression is less direct, pervasive, and frequent. Aggressive behavior is more often verbal than physical, and fantasies predominate over unusual behavior. Manifestations of drive-related fantasies are seen in quasi-artistic productions, such as "speed freak" drawings, where primitive and threatening fantasies are portrayed. The amphetamine user may sit for hours drawing frightened faces, decapitated bodies, and the like.

Object relations takes into account the degree and kind of relatedness to others, the extent to which present relationships are adaptively patterned upon older ones, and the extent of object constancy. It is interesting to note that for heroin users, the obtained mean for this function was higher in the intoxicated condition. Perhaps in this dose range, heroin tends to reduce anxiety and to allow for a smoother and more relaxed communication between people. This notion supports Hartmann's (1969) observation that "there is an attempt to overcome the lack of affectionate and meaningful object relations through the pseudo-fusion with other drug takers during their common experience." The heroin user is generally detached from others while under stress and strives for nurturant relationships of a dependent nature, leading to stormy or strained attachments. The amphetamine user, although more successful in object relations, tends to become involved in relationships with strong, unresolved oedipal elements. Castration fears tend to manifest themselves in unusual and extreme sexual behaviors, such as Don Juanism and homosexuality. Underlying concerns about masculinity and adequacy are expressed through repetitive sexual activity and a boasting attitude of sexual prowess and potency. Relationships may, however, endure for long periods of time, although they rarely have the stability and sustaining power of the idealized marital situation.

Stimulus barrier indicates the subject's threshold for, sensitivity to, or awareness of stimuli impinging upon various sensory modalities; the nature of responses to various levels of sensory stimulation in terms of the extent of disorganization, withdrawal, or active coping mechanisms employed to deal with medium or low stimulus barriers. Amphetamine users showed significantly higher stimulus barriers than did heroin users in the abstinent condition. Examination of the raw data revealed that 9 of 10 heroin users were rated low. Although it may be argued that long-term involvement with particular drugs may have specific effects on stimulus thresholds, stimulus barrier is considered to be the most constitutionally based ego function (Bellak et al. 1973). The data suggest that amphetamine users, with biologically high thresholds for excitatory stimulation, are seeking homeostasis (equilibrium) through self-medication. Amphetamine seems to put the user into closer touch with environmental stimuli which might otherwise be unavailable because of constitutionally based, high stimulus barriers. Conversely, the heroin user may have a predisposition toward excessive vulnerability to environmental stimuli. The user seeks to raise stimulus thresholds, allowing more adaptive function in a world of relatively painful and extreme stimulation.

Aggressive drive strength assesses overt aggressive behavior (frequency and intensity); associated and substitute aggressive behavior (verbal expressions, etc.); fantasies and other ideation: dreams, symptoms, defenses, and controls. The heroin user is seen as an individual whose overt acts of aggression are considerably more intense and frequent than average. The occurrence of physical assaultiveness and multiple suicide gestures is common. Hostile punning and witty repartee are often observed. It is speculated that the relative success of residential treatment programs is related to this phenomenon. Intensive confrontation in group therapy (a major treatment modality in drug programs) provides an outlet for excessive aggressive energy. For the amphetamine user, aggressive energy appears to be less excessive and is channeled more adaptively. Periodic breakthroughs of violence occur, but, with the exception of amphetamine psychosis, these expressions are usually not as frequent or intense as the heroin user's. Fantasies of violence are usually expressed verbally and sometimes find their expression through identification with radical political groups. This finding of greater hostility in heroin addicts than amphetamine abusers is echoed in a study (Gossop and Roy 1976) using different scales and a different population.

DISCUSSION

Although the observations for this study were made while male users were under abstinent and somewhat intoxicated conditions, it must be recalled that our subjects had all been heavy drug users for several years. It is, therefore, difficult to know if our findings represent a factor in the etiology of the pattern of drug use or the result of such drug use and its imposed life patterns. However, quantitative analyses and clinical impressions provide a framework for conceptualizing possible psychological differences between preferential users of heroin and amphetamine. Some speculate that these differences are related to early predrug patterns of childhood experiences.

The heroin user, who characteristically maintains a tenuous equilibrium via withdrawal and repression, bolsters these defenses by pharmacologically inducing a state of decreased motor activity, underresponsiveness to external situations, and reduction of perceptual intake: ". . . [a] state of quiet lethargy . . . [is] . . . conducive to hypercathecting fantasies of omnipotence, magical wish-fulfillment and self-sufficiency. A most dramatic effect of drive dampening experienced subjectively as satiation may be observed in the loss of libido and aggression and the appetites they serve." (Wieder and Kaplan 1969).

Our empirical observations support these formulations. Under conditions of low-dose morphine intoxication, heroin users showed improved scores for object relations and sense of reality, suggesting greater relaxation and less pressure from the drives. The finding of decreased libidinal drive strength points to a dampening of sexual appetite. This style of coping is reminiscent of the narcissistic regressive phenomenon described by Mahler (1967) as an adaptive pattern of the second half of the first year of life. It occurs after the specific tie to the mother has been established and is an attempt to cope with the disorganizing quality of even her brief absences. It is as if the child must shut out affective and perceptual claims from other sources during the mother's absence. This concept is consistent with earlier remarks by Fenichel (1945). Addicts are "fixated to a passive-narcissistic aim" where objects are need-fulfilling sources of supply. The oral zone and skin are primary, and self-esteem is dependent on supplies of food and warmth. The drug represents these supplies. Furthermore, heroin users show intolerance for tension, pain, and frustration. Drug effects partially alleviate these difficulties by reducing the impact of external stimulation through sensory numbing. The specific need gratification of the passive-narcissistic experience reinforces drug-taking behavior.

Relative to abstinence, however, the intoxicated heroin user shows an overall decrement in ego functioning. Regulation and control of drives, affects, and impulses and sense of competence were significantly lowered in our experimental situation. Deficiencies in general adaptive strength and the pressures of physiologic dependency set the groundwork for a vicious cycle. The heroin user must rely increasingly on a relatively intact ego to procure drugs and attain satiation. Ultimately, she or he is driven to withdrawal from heroin by the discrepancy between intrapsychic forces and external demands. Hospitalization, incarceration, and self-imposed abstinence subserve the user's need to resolve growing conflicts with reality.

In contrast to heroin and other sedative drugs, amphetamines have the general effect of increasing functional activity. Extended wakefulness, alleviation of fatigue, insomnia, loquacity, and hypomania are among the symptoms observed. Subjectively, there is an increase in awareness of drive feelings and impulse strength as well as heightened feelings of self-assertiveness, self-esteem, and frustration tolerance. Our observations support most of these generalizations. Amphetamine intoxication produced in our subjects elevated scores on autonomous functioning and sense of competence. Analysis of interview material shows subjective experience of heightened perceptual and motor ability accompanied by feelings of increased potency and self-regard.

As in the case of heroin, the alterations induced by amphetamine intoxication are syntonic with the user's characteristic modes of adaptation. This formulation is in agreement with the observations of Angrist and Gershon (1969) in their study of the effects of large doses (up to 50 mg/hour) of amphetamine: ". . . it appears that in any one individual, the behavioral effects tend to be rather consistent and predictable . . . moreover these symptoms tended to be consistent with each person's personality and style."

Energizing effects of amphetamine serve the user's needs to feel active and potent in the face of an environment perceived as hostile and threatening. Massive expenditures of psychic energy are geared to defend against underlying fears of passivity. Wieder and Kaplan (1969) suggest that the earliest precursor to the amphetamine user's mode of adaptation is the "practicing period" described by Mahler (1967). This period "culminates around the middle of the second year in the freely walking toddler seeming to feel at the height of his mood of elation. He appears to be at the peak of his belief in his own magical omnipotence which is still to a considerable extent derived from his sense of sharing in his mother's magic powers." There is an investment of cathexis in "the autonomous apparatuses of the self and the functions of the ego; locomotion, perception, learning." Our subjects' inflated self-value and emphasis on perceptual acuity and physical activity support the notion that amphetamine use is related to specific premorbid patterns of adaptation. The consistent finding that ego structures are more adaptive in the amphetamine user than they are in the heroin user suggests that regression is to a developmentally more mature phase of psychosexual development.

Reich's (1960) comments on the "etiology of compensatory narcissistic inflation" may provide further insight into the personality structure of amphetamine users. "The need for narcissistic inflation arises from a striving to overcome threats to one's bodily intactness." Under conditions of too-frequently repeated early traumatizations, the primitive ego defends itself via magical denial. "It is not so, I am not helpless, bleeding, destroyed. On the contrary, I am bigger and better than anyone else." Psychic interest is focused "on a compensatory narcissistic fantasy whose grandiose character affirms the denial." The high-level artistic and political aspirations witnessed in our subjects appear to be later developmental derivatives of such infantile fantasies of omnipotence. Although the amphetamine user subjectively experiences increments in functional capacity and self-esteem, biological and psychological systems are ultimately drained of their resources. As in the case of heroin, our study points to an overall decrement in ego functioning under the influence of amphetamine. The recurrent disintegration of mental and physical functioning is a dramatic manifestation of the amphetamine syndrome.

Differences in personality structure and function, such as those we describe in preferential users of heroin and amphetamine, provide clues which may permit careful delineation of a variety of treatment programs designed to meet the needs of particular groups of drug users. In accord with the theoretical and empirical formulations above, an experimental treatment milieu is projected in which drug users are presented with tangible, nonchemical alternatives, allowing for the crucial reversal from a chemically oriented regimen to a nondrug orientation. In the case of heroin, for example, treatment may be geared toward replacing previously drug-induced ego states characterized by (1) fantasies of omnipotence and wish fulfillment, (2) dampening of drive energies, (3) reduction of external stimulus input, (4) external regulation of self-esteem (Milkman and Metcalf, in press). Another need-specific treatment approach may be first to diagnose and then to treat differentially users who vary along the dimensions of trust and denial (Burke and Milkman 1978). Referral of preferential drug users to specialized treatment programs might increase the likelihood that the user will remain in treatment and that the outcome will be successful.

By viewing the problem from the perspective of the drug preferred, we have defined differences between users, but we also note basic similarities. An underlying sense of low self-esteem is defended against by the introduction of a chemically induced altered state of consciousness. The drug state helps to ward off feelings of helplessness in the face of a threatening environment. The pharmacologic effect bolsters the characteristic defenses deployed to reduce anxiety. Drugged consciousness appears to be a regressive state which is reminiscent of and may recapture specific phases of early child development. The child-like pattern of behavior is characterized by immediacy of reward without regard for the long-term, detrimental consequences of one's actions.

The parallels and overlap between the drug addictions and other "addictive processes," e.g., suicide, promiscuity, cults, crime, etc., are striking. It is believed that the predominant medical, social, and legal emphasis on substances may obscure fundamental psychosocial and cultural determinants of drug abuse and related problem behavior. The relative failure of contemporary "treatment" in the area of substance abuse highlights the need for increased understanding through innovative integrative channels. Blachly (1970) provides an early model for such a broadened scope. He sees drug use as one of a class of "seductive behaviors" characterized by (1) active participation by the victim, (2) negative attitude toward constructive consultation, (3) immediacy of reward, (4) potential for long-term impairment of functioning. While there is continued need for research and theory specific to drug involvement, e.g., cognitive style and physiologic responsiveness, we suggest an expanded focus on the "addictive processes." These may be collectively defined as the progressive or repetitious patterns of socioculturally and psychophysically determined seductive behaviors, detrimental to the individual, the society, or both (Milkman 1979).

An Availability-Proneness Theory of Illicit Drug Abuse

Reginald G. Smart, Ph.D.

Most simply stated, the availability-proneness theory of drug abuse involves the proposition that drug abuse occurs when a prone individual is exposed to a high level of availability. It is argued that the availability of or ease of access to all drugs varies enormously, as does proneness to use of these drugs for social or psychological reasons. Tendencies to use drugs should vary directly with both availability and proneness, and the two should sum to create an "addiction tendency." This suggests that both availability and proneness need not be high for all drug abusers. Where availability is excessively high, the level of proneness required among users could be lower than in situations of low availability. Where an individual's psychological or social proneness is very high, he or she may become a drug abuser in situations in which availability is low. Treatment of drug abusers should be successful only where large reductions are made in availability or proneness. Where relapses occur after treatment they should be in situations in which a return to earlier levels of availability or proneness is made. Continuation of drug use should occur whenever availability and proneness remain constant and acceptable to the drug user or abuser.

In general, this two-factor availiability-proneness theory makes use of much published research, integrating it into propositions which take account of many of the findings. The theory has some similarities to the vulnerability-acceptance theory of alcoholism adopted by Jellinek (1960) years ago but many differences as well. Unfortunately the theory has not had a large-scale independent test and has some weaknesses as well as some strengths. The theory attempts to account for initiation, continuation, and relapse from drug abuse with only two factors. Examination of the meaning and measurement of these factors is crucial to the understanding and further development of the theory.

AVAILABILITY

At the lowest level of drug availability are the proverbial Robinson Crusoe families set disconsolately on a desert island with no pharmaceuticals or plant-origin drugs available. No matter what their desires or previous habits there can be no drug abuse. Only available drugs can be used. There are many situations where availability of drugs is very great, e.g., in ghettos where heroin and other illicit drugs are routinely for sale. Opiates are also available to many rural farmers living in areas where opium-bearing plants grow, the best examples being farmers in Southeast Asia, Turkey, and parts of Mexico.

The concept of availability has several different meanings or facets. Availability refers to the set of physical, social, and economic circumstances surrounding the ease or difficulty of obtaining drugs, especially with respect to their costs and the amount of physical effort required to obtain them. When costs are high or the effort required is great, the tendency to use drugs will be low but can be overcome by a high level of proneness in the user. Availability may also refer to social aspects because drugs are more available in some social groups than in others. In some school, neighborhood, or other social situations, drugs are used by many if not all of the members. The availability of any drug, then, for a person new to this kind of environment is far greater than it would be in a non-drug-using group or in a school which does not countenance drug users.

Availability is also greater in some family situations than in others. It has been frequently noted that heroin addicts usually associate with other addicts, partly in order to keep their supply of drugs. Observations made in ghetto situations show that heroin is highly available and that many young men sample heroin, although few actually become addicts. Those who do tend to drop their nonusing friends. It is known (Smart and Fejer 1972; Kandel 1974) that drugs are frequently used by more than one member of a family. Studies of male drug addicts show that their spouses tend to use heroin even when they did not at the time of marriage.

Availability may be "perceived" as well as "actual." Actual availability takes into account the cost of drugs, number of sellers nearby, and the number of places to buy drugs. Perceived availability involves subjective estimates of that availability by users or nonusers. In practice, actual availability is unknown, and we must depend upon subjective estimates. Research supporting the idea that perceived availability was important in predicting drug use came from a study of high school students by Smart (1977). A multivariate analysis found that perceived availability was a significant predictor for four of six drugs--cannabis, heroin, alcohol, and tobacco, but not LSD or nonprescribed tranquilizers.

Further support for the crucial importance of availability in drug use comes from studies of professional and medical addicts. It is known that doctors, nurses, and pharmacists, who come into regular contact with drugs in work situations, have rates of opiate and other addictions many times greater than other professionals. They tend also to have better recovery rates than street addicts.

PRONENESS

Proneness to drug use or abuse may be of many types. Studies have shown that opiate addicts have numerous psychological problems before their addiction is developed, among them, impulsivity, psychopathic or sociopathic traits, low tolerance for frustration, weak ego functions, borderline schizophrenia (in some cases), depression, and alienation. Opiate addiction and other types of drug abuse are a coping mechanism for dealing with these psychological problems. However, another type of proneness can also exist, particularly in ghetto situations. Much research indicates that drug abuse is not merely an escapist activity but that it offers a chance at a life which is well paid, prestigious, and exciting in comparison to legitimate opportunities. (See Catton and Shain [1976] for a review of this area.) There are some indications (Glaser et al. 1971) that typical heroin addicts are especially prone to the frustrations of the ghetto world. Because they have more goals and aspirations their failure is more frustrating to them, creating a type of "social psychological" proneness to heroin addiction which is not merely of the escapist sort. Many heroin addicts, perhaps in addition to an escapist motivation, seek a lifestyle with a sense of purpose, group belonging, and excitement. Ghetto dwellers with poor educational attainment and poor job prospects have difficulty achieving such lifestyles legitimately. Because heroin and other drugs are so available, they are prone to develop an interest in them, use them, and perhaps become addict-dealers. They may, if opportunities exist and heroin is not available, become criminals to achieve the same sort of lifestyle.

The formulation of proneness as a seeking of a new lifestyle may explain ghetto heroin addiction but is less adequate for explaining professional or medical addiction. In professional addiction the addict does not usually change lifestyle; there is no group belonging and little excitement in obtaining the drug. In such cases, proneness will be of the "psychological deficit" sort and based on depression, anxiety, or a sense of frustration which is "treated" by the drug. As stated above, the level of proneness required for professionals to become addicts should be low given the high level of availability to which they are exposed.

STRENGTHS OF THE THEORY

The two-factor availability-proneness theory has a number of positive features. One is parsimony--with only two factors, the theory generates a few propositions which can be easily understood. It can account (post hoc) for many research findings concerning the habits and lives of addicts and can make specific predictions about a variety of phenomena. The theory makes predictions about beginning, continuing, ceasing, and relapsing into drug usage. Although intended primarily as a theory of opiate addiction, the major propositions seem suited to any type of drug use where addiction or abuse occur. The theory has a certain surface validity about it and is specific enough in many aspects to be tested empirically.

The theory has some linkage with a theory of alcoholism and could be applied to other social problems, such as criminality, with some changes. It helps to explain multiple-drug use in an individual, drug use in family and peer groups, and the reasons for poor recovery rates among addicts. The theory attempts to account for both "street" addicts and professional and medical addiction. It recognizes both the "escapist" and the more positive or "seeking" aspects of drug use, and allows both some importance in the same person.

Lastly, the theory suggests methods for prevention--reductions in both availability and proneness. It is likely that governments can reduce only availability over the short run (through laws, enforcement, etc.) and that reductions in proneness (reorganizing society?) will be much more difficult.

WEAKNESSES OF THE THEORY

The major weaknesses of the theory appear to be the following:

1. The theory is essentially a post hoc analysis and integration of ideas and research findings. It has not received an independent empirical validation for most of its propositions.
2. The major concepts of "availability" and "proneness" are not very specific, but they are global concepts with a variety of possible meanings. In any one empirical test they would require clear, unambiguous definition.
3. There is a physical analogy that can be made about the theory--that of a hydraulic pump: Where availability is high, proneness need not be and vice-versa. It remains to be seen whether this is an adequate representation of reality.
4. There are several situations in which availability is high but drug use is low--e.g., Turkish and Mexican farmers who grow opium do not appear to use it. It is difficult to believe that proneness is zero in those areas, and other explanatory variables are perhaps required.
5. The relative weight to be given to availability and proneness factors in a given situation can be expressed only in general terms. Further detailed or mathematical expressions of the contribution of each are required.
6. Special problems exist with the concept of availability in that the actual availability is almost never known for individual drugs. It may be surmised, but research will often be done with perceived availability or with one single aspect of actual availability.

Perceived Effects of Substance Use

A General Theory

Gene M. Smith, Ph.D.

The theory is referred to as being "general" because it attempts to identify common processes and mechanisms that might be involved in the use of a wide variety of substances: caffeine; cigarettes; alcohol; marijuana and hashish; LSD and similar hallucinogens; sedatives, such as barbiturates and tranquilizers; stimulants, such as amphetamines and cocaine; heroin and other opiates. The term "substance" is employed rather than "drug" to avoid an unprofitable debate over the appropriateness of using the term "drug" to refer to certain substances just listed. Our focus is on the effects of substance use as perceived by the user, whether or not those perceptions accord with other evidence.

This chapter specifies assumptions and speculates about mechanisms that might advance the understanding of the complex and often perplexing processes that range from initiation to compulsive substance use. The perspective presented here has been helpful to the author. Obviously, however, it is only one of many ways to conceptualize the processes under discussion.

SATISFACTION, SECURITY, AND SELF-ENHANCEMENT

We assume that most acts are intended to benefit the actor; to promote his or her self-protection and self-enhancement; to produce gratification; and to reduce frustration, boredom, depression, anxiety, guilt, and other forms of psychic distress. The fact that substance use is often in direct conflict with those objectives raises important theoretical questions regarding the dynamics underlying such use. It is not enough simply to observe that conscious and/or unconscious motives often lead to behavior that is irrational and self-defeating, and that compulsive substance use is merely one instance of such irrationality. Although true, that statement does not clarify the genesis of compulsive substance use[1] or help identify the mechanisms that permit such use to progress to levels of severe self-destructiveness.

First, we must acknowledge that substance use often is not self-destructive. Indeed, recognizing the satisfying and self-enhancing nature of substance use is essential to understanding the processes of initiation, continuation of use, escalation, cessation, and relapse. When and how is substance use satisfying and/or self-enhancing? What mechanisms enable use to continue and escalate even after its disadvantages have become substantially greater than it's advantages? The topics discussed below present observations and assumptions bearing on those and related questions.

PERCEIVED CONSEQUENCES OF SUBSTANCE USE

Consequences of substance use reported by the subject can of course be highly biased. Some consequences may be grossly misperceived. Some may not be recognized at all. However, if perceived consequences reflect the subject's estimate of the costs and benefits of his or her use, they can provide valuable information regarding the reinforcement contingencies that facilitate or inhibit the continuation of substance use. Paradoxically, information concerning perceived consequences of substance use might be more useful in clarifying the causes of use than in identifying its true consequences. We assume that the user's perceptions of the costs and benefits of his or her substance use are critically important in determining continuation or cessation of use--however erroneous those perceptions might be.

Although the process of evaluation need not be deliberative (or even conscious), we assume that substance use will continue as long as the perceived aggregate benefits are valued more highly by the user than the perceived aggregate costs. This cost-benefit relationship depends on many variables, such as which substance is used, its strength, the frequency of its use, the immediacy and intensity of its perceived effects, the needs the substance is perceived to satisfy and frustrate, the intensity of those needs, their importance and centrality in the user's life, and the effects use has on the user's concepts of Self and Ideal Self.

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[1] The categorical terms "use" and "abuse" are convenient for distinguishing well-regulated (and often beneficial) substance ingestion from unregulated, compulsive, and clearly detrimental ingestion. Unfortunately, when the term "abuse" is used, the nature and degree of abuse is rarely specified. The boundaries that separate use from abuse are ambiguous and debatable; and those boundaries vary from substance to substance and from user to user. In addition, the categorical nature of the terms "use" and "abuse" tend to obscure the continuous process by which substance use shades into substance abuse, and it diverts attention from the fact that the transition is a multivariate process that occurs concurrently along numerous dimensions which themselves are apt to be continuously distributed processes. For these reasons, we will not use the term "abuse" but rather will speak of use that is, or is not, compulsive.

We assume that any single act of substance use produces numerous and varied positive and negative effects. Some effects are perceived with greater accuracy than others; some with greater clarity and certitude than others. Some effects are not perceived at all, and some that are perceived are accorded little or no significance. We assume that dimly perceived substance effects, and even some effects that are beyond conscious awareness altogether, can influence future use; but that, in general, influence varies directly with the clarity and certitude of the perception of each effect and with the significance attributed to it by the user.

SEDUCTIVENESS OF PERCEIVED BENEFITS OF EARLY SUBSTANCE USE

Although most initiates believe that the benefits of occasional use outweigh its risks, any particular initiate will have varied and mixed attitudes, beliefs, and expectations regarding the potential advantages and disadvantages of substance use. This complex mix of attitudes, beliefs, and expectations generates a net effect representing an overall predisposition that can range from extremely positive to extremely negative. The more positive the net effect, the higher the probability of use, and the earlier it is likely to begin.

In the manner that caffeine is usually consumed, most users perceive the beneficial effects (mood elevation, increased alertness, and improved mental and physical performance) as easily outweighing the costs. Alcohol, in small amounts, is widely perceived as promoting conviviality, enhancing the pleasure of social interaction, and reducing unwanted inhibitions. Marijuana is perceived to produce euphoria and enhance enjoyment of food, sex, art, music, and hobbies for many users. Amphetamines and cocaine can produce mood elevation and perceived enhancement of performance. Barbiturates and tranquilizers can diminish psychic and physical discomfort; so can opiates.

Prior to compulsive use, the perception that the benefits outweigh the costs may indeed be valid, but as escalation proceeds, the actual aggregate net effects can become damagingly negative. One rarely (if ever) becomes a compulsive user without a considerable amount of previous noncompulsive use. The preponderance of perceived positive effects over perceived negative effects during the early stages of substance use can be the seductive bait that ultimately leads the user into the trap of addiction.

INDIVIDUAL DIFFERENCES INFLUENCING SUBSTANCE USE

In the preceding section we emphasized that well-regulated, noncompulsive substance use can be satisfying and rewarding. Yet, type and amount of substance use vary dramatically from person to person. For any particular substance, some individuals begin using as children, some begin later, and some avoid use altogether. At the adolescent and preadolescent age levels, what accounts for these differences? Relevant factors include (a) substance availability, (b) type and amount of substance use by members of friendship groups, role models, and other significant persons, (c) demographic variables, (d) genetic variables, (e) beliefs regarding the risks and benefits of substance use, and (f) attitudes, values, and behavioral propensities that comprise what is referred to here as "personality." Space limitations preclude discussion of all such potential determinants of use. We will comment only on the possible separate and interactive effects of substance availability, friendship groups, and personality.

Although illicit substances can be purchased at most schools, they are not equally available to all students. Availability depends on who the adolescent or preadolescent knows and how he or she is perceived by potential suppliers. If friendship groups include users, availability is greater, and the likelihood of use is increased; so is the likelihood of very early initiation of use.

Attitudes and behavior regarding substance use on the part of friends and role models (e.g., older siblings, parents, salient members of reference groups) influence the probability of initiation. If use is practiced by (or is acceptable to) such "significant others," initiation is more likely; it is also more likely to occur at an early age.

The longitudinal evidence now available indicates that nonusing adolescents who are most likely to use marijuana and/or hard drugs during later adolescence tend to be more rebellious and deviance prone; more alienated from parents; more critical of society; more impulsive; more emotional; more pessimistic and sad; more adventuresome and thrill-seeking; more sociable and extroverted; less traditional and conservative regarding values; less oriented toward religion; less orderly, diligent, and effective in work and study habits; less intellectually curious and interested; less determined, persistent, and motivated toward achievement; less likely to feel valued and accepted by others; less trustworthy and responsible; less tender and considerate of others; and less self-controlled. Moreover, many of those same personality characteristics differentiate early initiates from later initiates and, in addition, predict subsequent degrees of drug involvement (Jessor 1976; Mellinger et al. 1975; Segal 1975; Smith and Fogg 1977, 1978).

The results just mentioned reflect statistical regularities that apply to large groups of individuals. There are, of course, many exceptions at the individual level of analysis. For example, Smith and Fogg (1978) studied attitude and personality variables in a group of 651 students, all of whom reported being nonusers of marijuana when tested as seventh or eighth graders. When studied subsequently, 206 students reported that they had remained nonusers for the full five-year period of the longitudinal study; 128 reported one or more instances of marijuana use before completing the ninth grade; and 317 reported using marijuana during their high school years. A multiple discriminant function analysis involving five predictor variables[2] enabled the continuing nonusers to be discriminated from the early initiates with 80 percent accuracy. That classification analysis focused on the two most distinctly different groups among the three groups studied; but, even so, 80 percent is a very high degree of classification accuracy--especially when it is remembered that all students in the analysis were nonusers at the time the predictor variables were measured. Nevertheless, 20 percent of the students in the analysis were misclassified, and those 20 percent reflect various aspects of individual uniqueness not captured in the analysis.

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[2] The five predictor variables were obedience as measured by a self-report scale, obedience as measured by peer ratings, sociability as measured by peer ratings, and two self-report measures of attitudes toward cigarette smoking.

SUBSTANCE USE AND THE INTERACTION BETWEEN EARLY PERSONALITY DEVELOPMENT AND PEER-GROUP INFLUENCES

Friendship groups begin to form in the primary school grades, and it is likely that the behavioral predispositions of children comprising any given group tend to converge as members of the group share with each other the perceptions, experiences, values, beliefs, and life-orienting conclusions that influence personality development. Children with similar values, attitudes, and other personal characteristics gravitate toward each other; and that association strengthens the very characteristics that brought them together in the first place.

Children with personality characteristics that promote rejection of adult demands and expectations exhibit that rejection in many ways: e.g., disparaging academic achievement, smoking cigarettes, breaking school rules, and engaging in other types of early childhood deviance. Such children tend to aggregate and form friendship groups, some members of which are precocious regarding both their motivation to use substances and their ability to find sources of supply.

Similarly, children with personality characteristics that facilitate acceptance of, and/or compliance with, the rules and expectations of adult authorities tend to become members of friendship groups that support further development of those characteristics; and such groups are likely to contain fewer members who are precocious regarding access to, and motivation for, substance use.

Thus, early in preadolescence, an interactive process begins that is influenced by (a) personality formation of individual children; (b) reinforcement of that formation through interaction with like-minded children; (c) differences among groups regarding attitudes toward, and the use of, substances; and (d) differential availability of substances to such groups. We believe this interactive process contributes substantially to the considerable success with which substance use can be predicted from personality characteristics and attitudes measured prior to initiation of use.

FACTORS CONTRIBUTING TO CONTINUATION OF USE

The match between the needs of the user and the changes he or she attributes to the substance is important in determining whether or not use will continue. The individual who places high value on feeling strong, alert, decisive, and masterful is apt to find amphetamine or cocaine much more satisfying than a person who emphasizes peace, physical relaxation, and the contemplation of philosophical and metaphysical issues. A person of the latter type would probably find drugs like marijuana and LSD far more enjoyable. The better the match between the perceived substance effects and the user's needs, the more likely use is to continue.

Future use is also influenced by the intensity of the needs that are perceived as being satisfied by use. The greater the importance ascribed by the user to these needs, the more likely it is that use will continue.

The mood and cognitive changes caused by use of certain substances can temporarily alter the user's concepts of Self and Ideal Self. If use reduces the discrepancy between the user's perceptions of Self and Ideal Self, continuation of use is likely--even if those changes last only as long as the drug effect itself.

It is also possible for substance use to produce changes in personality that are more or less enduring; e.g., increased sociability and improved social skills in an adolescent who previously was painfully shy. If such changes are highly valued by the user, the probability of continued use will be increased substantially.

During the relatively early phases of escalation toward compulsive use, it is possible for consciously recognized dangers that are associated with substance use to facilitate rather than inhibit use if those dangers are experienced as more exhilarating than anxiety-provoking; if the self-initiated risks bring status and social approval to the user; or if the user pits any perceived dangers against his or her competence and self-control, and then treats the matter as a contest which he or she is sure to win. As long as the user continues to perceive the overall gain as greater than the overall cost, use will continue; and the risk of escalation to more dangerous levels of use becomes more likely.

It should also be noted that some behavior that appears to be completely self-defeating might in fact be aimed at achieving objectives that simply are not easily recognized by an outside observer. For that matter, they might not be recognized by the actor. The adolescent who (for whatever reason) has a strong need to punish the Self, a parent, or some other significant person might find the agonizing costs of compulsive substance use more than offset by the benefits produced by the punishment inflicted.

FACTORS CONTRIBUTING TO CESSATION OF USE

Although cessation itself is a single event, we assume that it reflects the outcome of a protracted process of assessment that has been ongoing (consciously and unconsciously) throughout most of the period of use. Factors that determine when (if ever) the advantages of cessation will be seen as outweighing the disadvantages include the following: changes in the user's life circumstances; increasing anxiety and concern regarding various potential losses associated with use; substitution of more cost-effective satisfactions for those previously obtained through substance use; increased attribution of importance to longer term costs and benefits associated with use; and a clearer recognition of the obstacles to achievement of important life goals posed by continuation of use.

Among children and young adults, examples of altered life circumstances that might facilitate cessation are moving from one neighborhood to another; changing friendship groups; graduating from high school; going to college; getting a full-time job; getting married; having children; and accepting new responsibilities associated with adulthood.

Anxieties and concerns that might lead to cessation include conflicts with parents, school authorities, and police regarding substance use; having a severely frightening drug experience or series of such experiences; fear of losing a valued job or jeopardizing one's career advancement; concern over the possibility of having a serious accident or suffering impaired physical or psychological health; fear of losing the respect and esteem of loved ones and friends; reduced self-respect; and fear that an immediate choice must be made between cessation now or a lifelong dependency on substance use.

Certain patterns of heavy substance use can cause hobbies, sports activities, and other previously enjoyable ways of spending time to become less rewarding. Success in rekindling those earlier interests, or in developing new ones, is apt to increase the likelihood that use will cease.

The probability of cessation is increased by any shift in orientation away from the present toward the future, or by any increased capacity to forego immediate gratifications to achieve more important subsequent ones. That probability is also increased if the user views continuation as being incompatible with achievement of long-term, significant life goals, especially if those goals are part of a clearly defined, carefully considered career plan that seems both achievable and likely to bring important future occupational, financial, social, and personal satisfactions.

IMPAIRED REALITY TESTING, COMPULSIVE SUBSTANCE USE, ADDICTION, AND READDICTION

Whatever its amount, frequency, and pattern, substance use will continue until the user perceives the disadvantages of use as outweighing its benefits. The subjective character of this cost-benefit relationship is emphasized once again because in many (perhaps most) instances of compulsive use, the user perceives use as having a net positive effect long after most outside observers would have concluded that the cost-benefit relationship had shifted from positive to negative.

As escalation progresses, cognitive functions (perception, memory, and judgment) tend to be altered in a manner that restricts and vitiates the feedback available to the user regarding the benefits and costs of use. This undermines the reality testing processes that might otherwise alert the user to his or her increasing vulnerability to addiction. Convictions based on early evidence that the aggregate net effect of substance use is positive may cause new and contradictory evidence to be discounted, misinterpreted, or denied altogether.

It is well known that memory is highly selective. This may be important in explaining why addicts fight and win the agonizing battle to become free of addiction, only to become readdicted after a period of abstinence. Perhaps the suffering is remembered as being less intense than it actually was. The likelihood of readdiction is increased by such retrospective cognitive distortions or by any other failures in reality testing that cause the recollection of past negative consequences to appear diminished in importance or that cause the recollection of past positive consequences to appear enhanced in importance.

Impaired reality testing might also promote readdiction by enabling the user to believe, erroneously, that the factors accounting for his or her previous addiction no longer apply. For example, the user might believe that he or she is now clearly aware of the warning signs that appear prior to the stage of compulsive use, will vigilantly heed any such warnings, and, in that manner, can achieve the pleasure of occasional, well-regulated, noncompulsive use without running the risk of readdiction. Or, if the individual's abstinent periods are themselves psychologically distressing (due to depression, anxiety, guilt, anger, etc.) and substance use reduces those discomforts, it might be quite easy for the user to misjudge the risks of readdiction and conclude that just enough substance can be taken to control those distressing mood states without returning to the level of compulsive use.

Impaired reality testing may also play a role in allowing the user to accord undue importance to immediate gratifications at the expense of more distant ones. Continued use is facilitated by ambiguity of long-term goals; by undervaluing either their importance or their likelihood of attainment; and by failing to recognize the relationship between continued use and the likelihood of achieving those goals. If support for the belief that substance use has a net positive effect becomes sufficiently weak, then the defenses that previously permitted the user to discount, misinterpret, or deny the true costs of substance use become harder and harder to sustain. The self-deception may then be recognized, and use may cease.

SUBSTANCE-INDUCED CHANGES IN MOOD AND SOMATIC FEELING STATES

Although most aspects of this theory concern mood states rather than somatic feelings, the latter are very important in determining usage patterns. Present information concerning the separate and interactive roles of mood and somatic feeling states in sustaining substance use is meager--even with a substance as widely used and as frequently studied as cigarettes. This is one of many issues regarding substance use that will require further investigation.

WITHDRAWAL DISTRESS AND THE SELF-PERPETUATION OF USE

Substances differ regarding the production of negative mood and somatic feeling states after their use. They also differ regarding the success with which such effects can be reduced by readministration of the original substance. The nervousness and jittery feelings that result from excessive consumption of caffeine are increased, not reduced, by ingesting additional caffeine; but those and other symptoms of excessive alcohol consumption can be reduced by taking additional alcohol. Escalation to compulsive use is a danger with any substance that can be ingested to alleviate withdrawal distress resulting from previous ingestion--particularly if the substance is one for which tolerance develops rapidly, with a resultant need for higher and higher dose levels to produce a given effect. It is well known, for example, that the aversiveness of withdrawal distress is powerfully important in driving the heroin addict to readminister.

Of course, the amount of substance used (and other factors, such as the route of administration) influences the likelihood that a user will be drawn into a cycle of self-perpetuating compulsive use. Cocaine, as presently used in the United States, rarely generates compulsive use, but it has been reported that in Peru and other South American countries, where coca paste is inexpensive and is smoked in large quantities, some users are catapulted to levels of intensely compulsive use with frightening rapidity (Jeri et al. 1978).

A Life-Theme Theory of Chronic Drug Abuse

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A complete account of the causes of drug use and abuse must consider at least three groups of factors: physiological, social, and psychological. Furthermore, it must explain both grouped data (such as means and correlations between variables that are measured by normative tests) and individuals. No one theory is capable of including all relevant factors at both group and individual levels. Consequently, the research scientist or clinical diagnostician must be in a position to evaluate all possibilities, weighing each according to its probable significance for the problem at hand.

The theory of drug abuse presented here concentrates on psychological factors in chronic drug abusers. It is personalistic in that it deals with individuals in all their complexity and uniquenesses. The ideas it contains are not "laws of behavior" but guides for understanding individual human beings.

This theory is also distinctive in that it calls special attention to the importance of the numinous aspects of human experience. "Numinous" means, roughly, spiritual and refers to the universal human tendency to construe the world and oneself animistically. In cases of drug use and abuse, numinous factors become most obvious when substances are assigned magical or mystical properties by their users, when drugs are incorporated into religious rituals, or when such substances are the means for producing transcendental experiences (which the commonly used term "euphoria" is hopelessly inadequate to describe). Numinous factors operate in everyone's life, and it is important that they be recognized and understood.

Since 1974, the Greater Kansas City Mental Health Foundation has been engaged in a program of research on the relationships between drug use/abuse and lifestyle. The program uses the representative case method (Shontz 1965, 1976; Spotts and Shontz 1980) an approach to research that must not be confused with ordinary case-study techniques.

A representative case is not a sample of a population or a person of "unusual clinical interest," but an exemplar of a variable or type of behavior that is of specific theoretical or practical concern. For example, in a study of the effects and use of cocaine the ideal representative case is not a person who takes the drug occasionally for recreational use, but one who is a genuine expert on the substance, who is committed to its use and who has tried it at all dosage levels and by all forms of ingestion. This person must epitomize cocaine use as clearly as possible and must be studied extensively and intensively, using both quantitative and qualitative means. He must be treated not as a "subject" but as a "consultant" or, at the very least, as an equal partner in the scientific enterprise. Research of this type can serve exploratory purposes, but it also provides a powerful tool for testing hypotheses that have been developed in large-scale studies but have not yet been validated in individuals (Spotts and Shontz 1980).

It is, perhaps, tempting to conclude that a method which advocates the study of "single cases" promises an easy or quick way to conduct research. Nothing could be further from the truth. First of all, it should be obvious that truly exemplary cases can be extremely difficult to locate. Hundreds of candidates may have to be screened before the appropriate individual is found. Second, data collection is long, arduous, and demanding because it involves not only days of intensive testing and interviewing but usually requires repeated evaluations over many months. Third, data analysis is complex and time consuming. Each subproject of the Greater Kansas City studies required factor analyzing nine correlation matrices of 15 variables each, nine correlation matrices of 27 variables each, 18 analyses of variance, each involving a complex, mixed model design, consisting of five factors, crossed and nested in most unorthodox fashion--all this to analyze a single type of data (Q-sorts). And these analyses constituted just a small part of what had to be accomplished to prepare the descriptions of each of nine representative cases. Finally, integration of cross-sectional and longitudinal, dimensional and morphogenic, qualitative and quantitative data, both within and between cases, poses a huge problem in data condensation, interpretation, and communication.

The research from which this theory was derived is based on the proposition that the intensive study of carefully selected individuals provides a unique perspective on the problems of drug abuse and, if properly conducted, yields as much information about specific drugs, their effects, dynamics and determinants of use, antecedents, consequences, and social correlates as more traditional methods.

This program of research has focused upon the intensive study of closely matched persons, each of whom had engaged in long-term use of cocaine, amphetamine or its congeners, narcotics, or barbiturates. The men were chosen from among hundreds of candidates because each was an expert who could speak with authority about himself as well as about his drug of choice, its effects, and the factors associated with its use. All were studied intensively and extensively with structured interviews and with dimensional and morphogenic tests.

Our theory draws heavily upon the germinal ideas of Carl G. Jung. It is appropriate that this be the case, for Jung derived his theory from the intensive study of individuals. Like any theory, this one is anchored in the methodology from which it was derived. Therefore, it is almost certain to differ in significant ways from theories based upon other approaches, research methods, and data-collection procedures.

The theory has three parts: a conception of personal structure, a conception of how personal structure develops, and a framework for describing the drug experiences of chronic, heavy users of several substances.

PERSONAL STRUCTURE

Every person is a complex mediator between two realities: the external physical/social environment, on the one hand, and the internal psyche, on the other. An investigator who observes or studies another person starts in the environment and first encounters that other person's overt actions. By noting regularities of behavior, the observer draws inferences about the outermost layer of the observed person's total structure, the ego.

The relationship between a person's ego and the environment is that of figure and ground. In the optimal state, the ego is clearly differentiated and maintains its integrity in relation to the environment. Too much expansion or contraction of the ego or too much effort either to transcend or to obliterate it is biologically maladaptive.

In addition to describing a person's ego, the observer may draw inferences about deeper levels of the personal structure. The first level below the ego is the lifestyle: the consistent and pervasive pattern, system, or organization of preferences, regularities, and orientations that underlies overt behavioral adaptation. Lifestyle variables include those described in other theories by such terms as habits, traits, or defense mechanisms. However, the concepts of habit, trait, and defense mechanism do not take into account the patterning, organization, and hierarchic structuring that make the lifestyle a system rather than a simple conglomerate or profile.

At first glance, the lifestyle of a pimp obviously differs from that of a real estate agent. Yet at a deeper level, both pimp and real estate agent may share the same determination to be indomitable, to be the most successful at what they do. We call the next level of basic organizing principles from which the lifestyle and ego derive their character life themes. In other theories, life themes might be called core conflicts, character structure, or dominant tendencies. However, most theories that rely on such constructs are content to consider them to be wholly learned and to be the most fundamental level of personal structure. According to this theory, neither is the case. For one thing, preprogrammed (archetypal) processes set the stage for learning of the life themes. For another, relations with the psyche by way of the personal myth are more basic than the life themes.

We found that most of our consultant-participants could be described in terms of no more than four to six themes. For example, one drug user's life is dominated by the determination to make a great scientific discovery that will justify his mother's faith that he is a genius. Another's is pervaded by efforts to gain love and attention from a powerful but affectionless father, while yet another's life is pervaded by the need to conquer women sexually in order to neutralize the power he feels they would otherwise have to emasculate him.

Finally, it became evident from our research that yet one more inferential step was necessary, for we discovered that, as Freud recognized in his concept of repetition compulsion (1929), each man seemed to be living out a destiny over which he had little control. Thus, at the deepest level of inference lies the myth or numen that gives each person's existence a fate-like, an entelechial, quality as if possessed by life-shaping forces over which personal control is not possible. In Jung's terms, the myth is the kernel or core of an "autonomous complex," a numinous, monadic formation that remains subliminal and operates according to its own inherent tendencies, independent of the conscious will. A well-integrated myth may be expressed in creative work. Poorly integrated into the rest of the personal structure, it may cause maladjustment (Jung 1971). The myth serves a purpose in human life that is equally important to that served by the ego. The function of the ego is to insure biological survival, and in modern society, that typically takes place by means of technological or economic achievement. The function of the myth is to insure wholeness or unity of the person. Like Janus, the two-faced god, each individual faces both environmental and psychic realities. A balanced responsiveness to both is necessary if equilibrium is to be maintained (Larsen 1976). In a person who is functioning well, the ego insures biological survival by adapting to environmental realities, while the myth insures wholeness through insuring the ego's relatedness to psychic realities.

OPERATIONAL CONSIDERATIONS

Direct observations of behavior provide the basis for inferring ego structure. Psychological tests penetrate to at least the level of lifestyle. Intensive interviews and projective examinations usually permit reasonable reconstruction of life themes. However, discovery of another person's numen or myth requires not only a knowledge of the person but some familiarity with mythology as well as personal empathic and intuitional freedom on the part of the investigator. To insure reliability, therefore, it is desirable for the process of myth identification to involve more than one person.

NORMAL DEVELOPMENT

During the earliest years of life, the human infant is dominated by influences from the psyche, the most important of which is the image of the mother (a precursor of the anima archetype). Although the newborn infant is not totally helpless, human beings are born unfinished, unready to meet the world, and the child must spend some time in the psychic atmosphere of the parents, in a second womb, as it were, where it must rely heavily upon others for safety, security, and survival (Campbell 1949). This is the stage in which, at the level of myth, the elementary or nuturant mother predominates (Neumann 1972). After a year or so, ego tools (speech, ambulation, motor coordination) start to develop, and a stage of emerging individuality begins. At this point the normal mother takes on the function of transformation by helping the child break away from her and become an independent person. The child's first experience of the process of transformation is reminiscent of being born and is incorporated into the child's myth as a prototype of the theme of rebirth that may be activated later in life during religious or quasi-religious experiences.

Normally, at least for boys, the father enters the picture at this stage and eventually becomes a model according to which the child's personal myth is elaborated in relation to the animus, or archetype of masculinity. If the father is absent or provides an unsuitable model, the transforming mother may assume this function and become, in effect, the animus of her own anima. The result is confusion over sexual identity in the child. More typically, the transforming anima requires that the boy increase in competence to win her approval, while the father teaches the boy how to accomplish this and to displace the anima away from the biological mother to a more suitable woman. During these formative years, the child's life themes begin to take form.

At adolescence, the boy becomes initiated into adulthood and begins developing his own lifestyle, the ways in which he chooses to express his life themes. Adolescence contains an important danger point. At this time, tolerance for numinous experiences is diminishing, but the pressure from such experiences may not shrink sufficiently rapidly and the ego may not yet be strong enough to solve the problem realistically. This is the so-called adolescent crisis, and it is the culmination of a condition that develops from early childhood (Edinger 1973, pp. 3-36). After this crisis is passed, growth is for several decades a process of ego development and gradual alienation from numinous psychic influences.

At mid-life another phase begins. The now overdeveloped ego may become so estranged from its mythical roots in psychic experience that the person begins to feel a need for spiritual wholeness, for a meaning in life. During this period the person counteracts the growing sense of alienation by returning to inner experiences or spiritual and religious sources for support and reintegration (Edinger 1973, pp. 37-71). If he is successful, the result is the emergence of a new, more complete identity called the self. This is the culmination of personal actualization; the process of self-development (called individuation) may continue for the rest of the person's life.

PATTERNS OF DEVELOPMENT IN CHRONIC DRUG ABUSERS

In this section, we briefly describe the typical or modal developmental patterns that have emerged from our research with men committed to heavy or chronic use of amphetamine, cocaine, narcotics, or barbiturates. Although the developmental patterns of these relatively "pure" drug-user types show striking differences among groups, explainable variations and even occasional reversals of these modal patterns also appeared.

This discussion does not concern individuals who use drugs only for social-recreational purposes. Unlike recreational drug users, chronic drug users do not take drugs merely for pleasure. Individuals who are committed to the heavy, long-term use of drugs do so to--

1. Fill gaps in their personal structure and mediate serious breaks between their rational (ego) and psychic (mythical) lives;

2. Attain by chemical means, even if only temporarily, ego states they cannot attain by their own efforts; and

3. Cope with ego deficiencies that have a developmental origin and handicap them in their efforts to achieve individuation.

This theory does not assume that problems of adjustment can always be blamed on the parents. People do not react to their parents as they really are but to parental imagoes--unconscious images that are heavily influenced by fantasies and archetypal contents. Furthermore, in specific cases, a host of constitutional, social, and environmental factors also enter into a person's decision to try or use drugs. Nevertheless, the theory does recognize the existence of certain modal patterns in drug users' reports of their early developmental years.

Most typically, the chronic amphetamine users we have studied report that they grew up in families with relatively strong but highly manipulative mothers and passive or ineffectual fathers. The mothers of these men emerge as devious, ensnaring women ("spider women") who skillfully, though not always consciously, practice complex acts of deceit and deception to keep their men firmly within their web of control. The controlling and potentially castrating mother handicapped the boy in developing a strong ego, and the absence of a strong father left the boy without a firm sense of masculine identity. The solution commonly adopted by the boy was not only to deny feelings of helplessness and fears of impotence but to convert them into their opposites by assuming a phallic and hypermasculine posture toward life. As adults, these men fear the feminine and view women as creatures to be conquered, overcome, used, or exploited. They take great pride in their sexual prowess, for it provides them proof of their manhood and emancipation from the "spider" mother of childhood. Chronic amphetamine users tend to be driven, sometimes violent, but achievement-oriented men who are strongly reactive against threats of weakness or impotence. Typically, they are unreflective action-oriented men who lack insight or rigidly deny the reality of their psychic lives. Nevertheless, they are subject to numinous influences that seem to be dragging them inexorably downward into the maw of the ever-threatening maternal figure.

In contrast, narcotics abusers typically said they came from psychologically disabled families, in which one parent (often the father) was absent or was an overpowering tyrant, while the other parent (often the mother) was too weak or ineffectual to protect the son from the attacks or intimidations of the other. As adults, the opiate users we studied were seriously disabled individuals who maintained tenuous and unstable adjustments. Their egos were poorly or weakly differentiated. Although they showed greater overall personal disturbance than cocaine or amphetamine users, they did not display a distinctive set of symptoms. With few exceptions, the narcotics abusers were vulnerable people who relied on ego constriction as a primary defense. Typically, they are isolated individuals who live quiet, lonely, and unambitious lives. Unlike cocaine and amphetamine abusers, narcotics abusers do not seek stimulation but steadfastly avoid it. They seek a tranquil, serene existence through ego constriction; they would rather withdraw from the problems of life than conquer them.

The cocaine users we studied seemed to have progressed further along the developmental path than men in the other groups. Most described early lives characterized by a rather high level of positive family feeling. Most described their mothers as warm and their fathers as strong and encouraging. As adults, the cocaine users are ambitious, intensely competitive men who work hard to become successful. They like to take risks and live by their wits. They have stronger and more resilient egos than men in the other drug-user groups. They display a more intense commitment and willingness to struggle to overcome their environment but are highly prone to symptoms of alienation from the psyche. They think of themselves as self-directed, self-sufficient, competent people--proud, energetic men who live life to the full and are capable of carrying pleasure to its extreme. The key to understanding the cocaine users we studied is their intense counterdependency, their need to be completely self-sufficient. They cannot lean on others, turn to other people for help, or admit weakness of any kind. They take cocaine to expand their egos and their self-confidence. In addition, they report that the drug produces temporary psychological states that are so ecstatic that life and fulfillment seem complete, if only for a moment.

By contrast, barbiturate users seemed to grow up lacking meaningful relationships with either parent. Most described families with uninterested, neglecting fathers and timorous, dependent, and ineffectual mothers. Most were reared in emotional wastelands and might have been better off psychologically if their parents had been openly rejecting. The typical son seems to have concluded that, if he could not gain recognition by pleasing his parents, perhaps he could make them acknowledge his existence by granting their apparent wishes and failing at everything. Barbiturate abusers repeatedly perform acts which seemingly tempt fate to destroy them. They report an alarmingly high incidence of fights, car wrecks, accidents, and drug overdoses. From an observer's point of view, these men as adults seem actively to seek defeat. However, from their own point of view they seek escape from their personal distress, frustrations, and failures, and barbiturates provide them a vehicle which allows them to do it. It is not that these men enjoy defeat. Each succeeding setback and reversal adds to the gradual disintegration of the self and increases the internal pressures and frustrations these men feel. They are like boilers about to explode, for their frequent failures and frustrations cause a rapid buildup of tension that they are unable to express in a controlled way. For them, barbiturates precipitate the inevitable; by artificially reducing ego inhibitions, these drugs provide the counterfeit courage the men need to release pent-up destructive forces. The drugs give the user a ticket to oblivion, thereby permitting him to get away from his sense of failure for a period of time, or they set the conditions which allow the user to release his tensions in arguments, brawls, and accidents, with no subsequent sense of guilt, responsibility, or even awareness of what happened.

DRUG-INDUCED EGO STATES

As indicated above, relations between ego and environment are like those between figure and ground in gestalt psychology. These may vary along two major dimensions. The first is ego expansion versus ego contraction. Ego expansion implies growth in the person's figural ego, his sense of dominance or control over both self and environment. Ego contraction implies reduction of ability to manage the environment; in contraction, the ego protects its integrity by limiting its figural relation with the ground of the surrounding world.

The second dimension is ego/self synthesis versus ego/self dissolution. Synthesis of ego and self occurs when transcendent experiences lead the person to believe that the bounds of ordinary reality have been surpassed and a mystical truth discovered. In ego/self dissolution, all sense of personal continuity and responsibility is lost, so that the state is one of psychological oblivion.

Chronic drug users attempt to avoid the suffering that would be necessary to reestablish normal individuation. They use pharmacological means either to escape their personal dilemmas or to achieve ego states that would in other persons be associated with increasing selfhood. The states they achieve are actually counterfeit, because, while their practical effects are real enough, they produce no permanent change in personal structure and typically do not outlast the period of drug usage.

STIMULANTS

Our studies indicate that stimulants, such as amphetamines and cocaine, produce ego inflation or expansion, which is experienced by the user as an increase in bodily warmth, exhilaration and euphoria, enhanced self-awareness, feelings of supreme self-confidence, and a sense of mastery over fate and the environment. With large doses and chronic use of these drugs, the figural ego becomes so grossly inflated that the normal ego-environment relationship is overbalanced. The bloated ego becomes threatened by impulses it can no longer control, and reality testing becomes impaired. At this stage, the ego may implode, producing the well-known amphetamine or cocaine psychosis.

Several differences exist between the expansive effects produced by these two drugs. First, chronic cocaine users do not display the stereotypy or patterns of compulsive behavior that are found in amphetamine abuse. Second, cocaine abuse seems less conducive to direct violence than does amphetamine abuse. Finally, cocaine produces less hyperactivity than amphetamine. The amphetamine-induced ego state mobilizes the user for action. The cocaine-induced ego state is not a means but an end. The user has no further goal. His only problem is that he must continue using the drug to stay where he is.

NARCOTICS

The ego states induced by narcotics are the opposites of those aroused by stimulants. Narcotics (i.e., opium, its derivatives, and semisynthetic substitutes) produce ego contraction: a disengagement from the environment and withdrawal into a quiescent state and detachment of concern. Massive doses may induce a stuporous or comatose condition that could culminate in death due to respiratory arrest. The euphoria that accompanies narcotics use is not the sort that is associated with conquest or achievement but with relief from tension or from engagement with worldly affairs. Although care is suspended, the typical user does not seek complete loss of ego relationships with the environment; even an addict who is on a deep and pleasurable nod may be provoked into activity by stimulating or irritating events. Narcotics addicts seem to feel they have achieved an ethereal experience of peace, contentment, and serenity which makes normal activity, striving, or achievement unnecessary or trivial.

BARBITURATES

Despite the fact that barbiturates are classified as depressants and are thought of as having effects similar to narcotics, the two types of substances produce strikingly different ego states. In low doses, barbiturates produce mild sedation. However, in chronic heavy use, the person becomes increasingly disabled, and a state of ego/self dissolution ultimately ensues. All ego functions are crippled; thinking and reality-testing decline, and visual-motor coordination, speech, memory, concentration, and judgment are impaired. In the ego state induced by barbiturates the user abandons responsibility for and awareness of his actions; some fall into a comatose condition which can bring about death. Others enter a disoriented state (similar, apparently, to that produced by heavy use of alcohol) in which they commit destructive acts with no concern for or awareness of consequences. They become belligerent, quarrelsome, and abusive, and engage in fights, arguments, and other violent confrontations. They are frequently the victims of accidents. The psychological state induced by barbiturate abuse might well be called oblivion, because, while in it, the users are all but egoless.

PSYCHEDELICS

We have not studied persons with a commitment to psychedelic drugs (such as LSD-25). However, the literature suggests that such drugs induce a state of apparent transcendence, or synthesis of the ego and the self. These drugs produce profound alterations in sensory experiences as well as mood. It is believed by some that psychedelics produce a religious or spiritual state in which the user feels outside ordinary reality, at one with the cosmos. Some users report gaining insight into the nature of the universe and purpose of life, the oneness, brotherhood, and togetherness of all living things. However, since "bad trips" may also occur, it is likely that set and setting strongly influence responses to psychedelic substances.

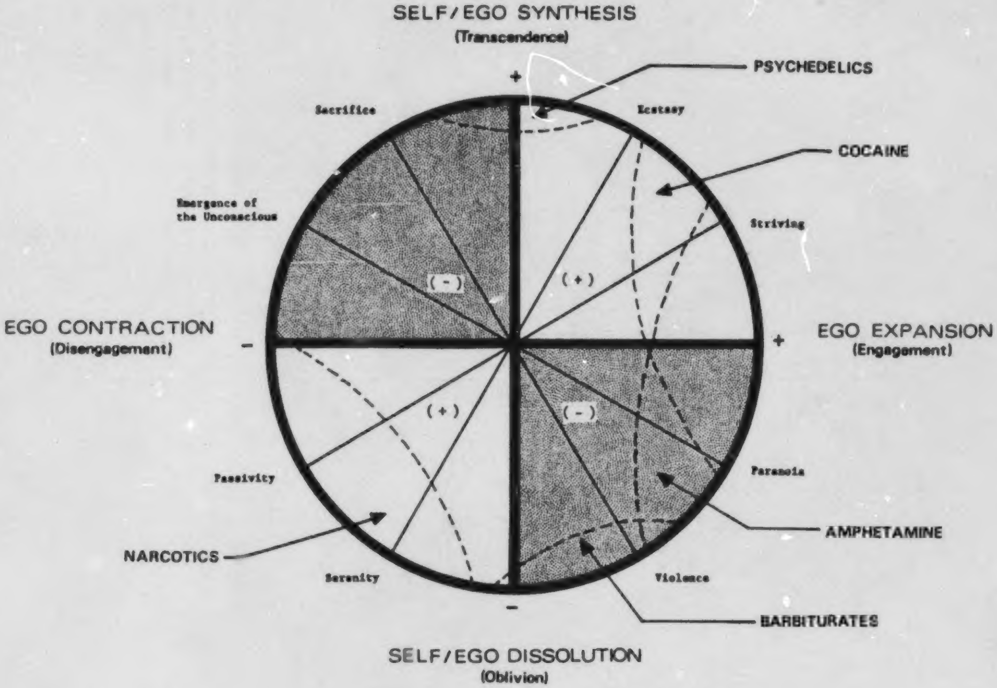
AN INTEGRATING MODEL

Clearly, chronic use or abuse of differing classes of drugs produces radically different ego states. These transformations are diagrammed in figure 1. This figure shows a matrix of dimensions that may be used to define the ego states induced by five major substances of abuse. The horizontal axis represents ego contraction (minus) and ego expansion (plus). The vertical axis represents ego/self dissolution (minus) at the bottom and self/ego integration at the top.

As products of like signs, the upper right and lower left quadrants are labeled plus. They represent generally pleasant experiences, which differ mainly in that those in the upper right are active, while those in the lower left are passive. The upper left and lower right quadrants are labeled minus and represent generally unpleasant, ego-alien, or disintegrative experiences. Those in the lower right are directed outward toward the environment either through projection or direct physical attack, while those in the upper left are directed inward, arise from, and are contained within the psychological structure of the person. The representation of two dark and two light quadrants indicates that the counterfeit states induced by abuse of various drugs can have both positive (or light) and negative (or dark) side effects.

The top of the diagram is also labeled transcendence. It represents experiences that lead the user to believe that the bounds of ordinary reality have been surpassed and a mystical truth discovered. The bottom of the diagram is labeled oblivion and represents the fact that, in this state, all sense of personal continuity is lost. The left side of

FIGURE 1.—*Counterfeit ego states induced by chronic abuse of several types of drugs*


SELF/EGO SYNTHESIS
(Transcendence)
+
PSYCHEDELICS
Sacrifice
Ecstasy
COCAINE
Emergence of the Unconscious
Striving
(-)
(+)
EGO CONTRACTION
(Disengagement)
-
EGO EXPANSION
(Engagement)
+
(+)
(-)
Passivity
Paranoia
AMPHETAMINE
NARCOTICS
Serenity
Violence
BARBITURATES
-
SELF/EGO DISSOLUTION
(Oblivion)

the diagram is labeled disengagement to reflect the fact that ego contraction implies a reduction of personal contact with the environment; the weak or threatened ego retains its integrity by limiting its figural relation with the ground of the surrounding world. The right side of the diagram is labeled engagement to reflect the fact that ego expansion implies an increase in the person's sense of dominance or control over both the self and the environment; the figural ego swells, providing increased belief in one's personal power and importance.

To the right of the vertical coordinate is a dimension that runs from ecstasy (which arises from achieving a near-transcendent state through one's own efforts), to peace or serenity (which stems from the passive disengagement of ego concerns). Next is a dimension that runs from striving (which is oriented more toward conventional than spiritual achievement), to passivity and relaxation, or loss of interest in the normal activities of life.

Just below the horizontal coordinate on the right a dimension runs from paranoia, or projection of unconscious impulses outward, to emergence of the unconscious or the flooding of awareness with impulses of a psychic nature; some psychoanalysts might call this the "return of the repressed." Finally, a dimension runs from violence, which usually consists of attacks on others but may have self-destructive consequences as well, to sacrifice, which means opening up (disintegrating) the ego to the acceptance of psychic reality. As used here, the term violence does not mean controlled violence, of the sort used by professional athletes or policemen, but an explosive, unthinking rage in which all sense of identity is lost.

As indicated, the ego states induced by chronic, heavy abuse of stimulants, narcotics, depressants, and psychedelic drugs fall into distinctive sectors of figure 1. The placements of different drugs are indicated by broken lines on the diagram. These reflect our current judgments regarding the states these substances produce in individuals committed to chronic heavy use of each substance. For example, the placement of cocaine shows that, while it may produce paranoia, it does not typically precipitate the violence that is often associated with amphetamine or barbiturates. Also, although it shares features in common with amphetamine, users report that cocaine produces a state of ecstasy that is apparently unique.

Narcotics induce ego contraction, disengagement, or serenity. However, especially in very large chronic doses, they may awaken terrifying phantasmagoric images (such as those that affected Thomas DeQuincey and Samuel Taylor Coleridge), which indicates that unmanageable unconscious material has broken loose and is emerging into awareness.

Barbiturates may produce some positive effects, like relaxation, but with heavy use, the dark side effects of violence, self-destructiveness, and loss of self-identity outweigh the pleasant ones. Indeed, heavy barbiturate use seems to yield more socially and personally destructive acts than any other form of drug abuse.

We have not studied alcohol abusers but feel that the ego state produced by alcohol is similar to that produced by barbiturates, though at a less intense level. We also believe that people who take psychedelic drugs regularly may do so in an attempt to achieve something akin to spiritual enlightenment. However, psychedelic drugs are unpredictable, and there is always the danger of a bad trip, the emergence of chaotic material from the psyche into consciousness.

We have not studied long-term polydrug abusers, but it appears that attainment of a specific ego state may be irrelevant for these individuals. They seem to be willing to enter any drug-induced ego state, so long as it differs in strong or noticeable ways from the ego state which exists during abstinence. These individuals may well be more disturbed and have fewer personal resources than any other group depicted in figure 1.

REASONS FOR DRUG CHOICES

The various groups of drug users we studied have each gravitated to substances that induce temporary states that help them cope with specific disturbances in ego/psyche relationships. Because of adverse developmental conditions, these individuals are unwilling or unable to pursue a normal course of individuation. They seek shortcuts, a pseudointegration by means of counterfeit ego states produced by pharmacological agents.

Amphetamine abusers have failed to develop the tender, compassionate sides of themselves and view women as terrifying creatures who threaten to render them impotent. With the aid of amphetamine, these men attempt to live a precarious but hypermasculine existence. Cocaine abusers have similar traits but are somewhat more resourceful and better integrated; they fight for what they want and regard normal dependency as defeat. They are subject to crises of alienation and feelings of emptiness and despair. Cocaine provides them a powerful, though counterfeit, substitute for the warmth and nurturance they need.

Narcotics abusers are poorly defended against the environment and their own psychic lives; they use drugs to help shrink their egos so that they can maintain limited personal integrity in the face of internal and external forces they cannot control. They seek serenity and an ally which will provide temporary relief from anxieties and help them function in a limited but more integrated way.

Barbiturate abusers are neglected individuals who believe they have received little love, attention, or respect in life. Drugs provide these men temporary release and escape from identities which mark them as perpetual failures in their own eyes.

Drug Use as a Protective System

Leon Wurmser, M.D.

The following discussion is restricted to the psychodynamic study of "compulsive drug use," the latter being defined as any form of substance abuse where there is substantial subjective psychological need to resort to or to continue using mind-altering substances in disregard of possible noxious consequences that such use socially, legally, somatically, or psychologically entails. It is a relative, not an absolute concept, a "more or less," not an "either/or." What is experienced as "freedom of choice" versus "irresistible intense necessity" is arrayed in a "complemental series" (Freud 1926). As a rule, such use is based on severe inner conflicts, developmental disturbances, and serious family pathology, unless it is used to cope with the effects of "minimal brain damage."

AFFECT DEFENSE

Drug use is preeminently a pharmacologically reinforced denial--an attempt to get rid of the feeling import of more or less extensive portions of undesirable inner and outer reality. It is a defense making the emotional significance of a perception of the outer or inner reality unconscious, inoperative, irrelevant. The broader such blocked-out emotional significance becomes, the more the personality is drained of vitality, of identity, of inner richness.

What is centrally denied in compulsive drug users are affects of a potentially overwhelming nature. In short, drugs are used to forestall or soothe affective storms or nagging dysphoric moods.

This presupposes not solely a proneness for this particular archaic defense, but also an inclination for what has been described as affect regression (Krystal 1974)--the global, undifferentiated nature of emotions that can often only scantily be put into words and other symbolic forms (hyposymbolization), but is instead partly converted into somatic sensations. (Many drug addicts are today's version of conversion hysterics!) Anxiety of an overwhelming nature and the emotional feelings of pain, injury, woundedness, and vulnerability appear to be a feature common to all types of compulsive drug use. The choice of drugs shows some fairly typical correlations with otherwise unmanageable affects--narcotics and hypnotics are deployed against rage, shame, jealousy, and particularly the anxiety related to these feelings; stimulants against depression and weakness; psychedelics against boredom and disillusionment; alcohol against guilt, loneliness, and related anxiety. This means we immediately recognize the following layering: (1) drug use, (2) affective storms or chronic dysphoria representing such unpleasant affects, (3) underlying pathology of a hysterical or obsessive-compulsive, of a phobic or depressive, or occasionally of a psychotic or organic nature. Symptom and character neuroses usually coexist.

Where such broad chunks of reality are sapped of their lifeblood, so to speak--due to widespread denial--we find something very characteristic of many drug users--depersonalization and the impression of a "false self"--of a double personality, split into a docile, submissive, conforming self, and one of violent rebellion and deep hurt.

PHOBIC CORE

Addictions and phobias parallel each other in structure, though with inverted valence. While the addict compulsively seeks an external object to serve as protector mainly against vague anxiety of unknown meaning, the phobic compulsively avoids an external object to serve as representative for vague anxiety of unknown meaning. Even more specifically, we find in the history of most addicts phobic systems as antecedents of their current problem. More and more I see, at least in most addicts, a phobic core as the infantile neurosis underlying the later pathology, typically the fears (and wishes) around being closed in, captured, entrapped by structures, limitations, commitments, physical and emotional closeness and bonds. This concrete or metaphorical claustrophobia is seen, as primary phobia, very close to the original experience of traumatic anxiety, the strangling feeling of being closed in and confined. The limits given by one's conscience and outer societal limitations and watched over by the so important guardian feelings of guilt and shame are foremost examples of claustra that must be broken or eluded.

Where there are phobias, there are protective fantasies--fantasies of personal protective figures or of impersonal protective systems, specifically counterpoised to these threats. This search for a protector against the phobic object and the anxiety situation almost inevitably leads to a compelling dependency on such a counterphobic factor--a love partner, a fetish, a drug, a system of actions, the analyst. Most typically, drug addiction is fulfilling a protective fantasy defending against the phobic core. Protective objects and protective systems show "return of the repressed." Many of the frightening features are covertly present in the protector. Paradoxically, the claustrophobic seeks the shelter that turns into a new claustrum; he or she will find this in the transference to the therapist as well.

Similarly these protectors are highly (narcissistically) overvalued. They are expected to be all-powerful, all-absolving, all-giving, yet also feared to be all-destructive, all-condemning, all-depriving.

HELPLESSNESS AND REVERSAL

Many compulsive drug users were severely traumatized as children. Child abuse is, in the simplest and strongest terms, one of the most important etiologic factors for later drug abuse. A child cruelly beaten or exposed to severe, often homicidal violence in the immediate surrounding, a child involved in sexual actions of adults, a child subjected to relentless intrusions or endlessly deceived and mystified has a number of other defenses at its disposal to deal with the abysmal sense of helplessness (besides denial).

The helplessness reflected by the state of primary phobia (claustrophobia) especially and the pain of repeated feelings of having been uncontrollably overwhelmed, traumatized, are defended against by a thick crust of narcissism. Grandiosity and haughty arrogance, more or less extensive and deep withdrawal of feelings from the painful environment and, hence, coldness and ruthlessness are typical features of such a narcissistic defense. It is often papered over by a superficial amiability, friendly compliance, and flirtatious charm--the hallmarks of the "sociopath."

Even more broadly, one can recognize the consistent use of the defense of turning passive into active. Just as the patient suffers and fears disappointment as a main theme of life, he or she does everything possible first to enlist help, but then to turn the tables and to prove the therapist helpless and defeated. Very closely related to this is the pervasive use of defense by externalization. It is a counterpart to denial, just as projection is to repression. In it "the whole internal battle ground is changed into an external one" (A. Freud 1965). It is the defensive effort to resort to external action in order to support the denial of inner conflict; the latter is changed back into an external conflict; for example, ridicule, rejection, and punishment are provoked by, not just suspected from, the outside world. Limit-setting is invited and demanded but then endlessly fought against. Its aim is to take magical, omnipotent control over the uncontrollable, frightening. Such action for action's (and, implicitly, punishment's) sake is reflected not merely in excessive drug taking, but in gambling, racing, motorcycle jumping, lying, cheating, and violence.

EGO AND SUPEREGO SPLITS

It is part of the archaic defenses, the affect regression, and the traumatized ego core that there is a remarkable discontinuity of the sense of self. Patients often are or resemble "split" or "multiple" personalities. What is characteristic is the sudden total flipflop, a global lability with no mediation and no perspective. It is the unreliability that is so infuriating for others, so humiliating for themselves.

This is not a defense, but an "ego defect," a functional disparity that affects not solely the ego, but no less the superego. Ideals and loyalties are suddenly replaced by more primitive commitments and pursuits of grand designs.

SHAME

As a consequence of the predominance of narcissistic concerns and vulnerability, shame and the compulsive provocation of humiliations and putdowns assume particular prominence. Shame is the experience of being exposed as weak, a failure, as not living up to an image that one wishes to have of oneself. With strongly grandiose self-images, coupled with exaggerated expectations of what others could and should do, there is a continued proneness to massive disappointments, to "narcissistic crises."

THEORIES ON

One's Relationship to Others

Psychological, Social, and Epidemiological Factors in Juvenile Drug Use

Isidor Chein, Ph.D.

OVERVIEW

Over the last several decades, the use of narcotics by juveniles has reached "epidemic" proportions. When this phenomenon became widely publicized, not a great deal was known about its meaning, origin, or the dangers implicit in it. Although this may not have been the first such flareup of drug use in this country, and although it was "viewed with alarm" when it came to public attention, no valid and systematic studies of the problem had been made (Lindesmith 1947; Dai 1937; Terry and Pellens 1928). Thanks to the intervention of the National Institute of Mental Health (United States Public Health Service), however, the wave of juvenile drug use which occurred in the early 1950s became the subject of relatively intensive study. We are now in possession of a wealth of information, collected systematically and with a view to testing specific hunches and hypotheses.

This paper, prepared by Jean B. Wilson and reviewed by Harold B. Gerard, Ph.D., is based largely on findings originally presented in "Juvenile Narcotics Use," by I. Chein and E. Rosenfeld, reprinted from a symposium entitled NARCOTICS, appearing in Law and Contemporary Problems, volume 22 (no. 1, Winter 1957):52-68, published by Duke University School of Law, Durham, North Carolina, copyright 1957 by Duke University. It also includes findings highlighted in "Psychological, Social and Epidemiological Factors in Drug Addiction," published in 1966. The reader who is interested in pursuing Dr. Chein's work further is referred to his 1965 article, "The Use of Narcotics as a Personal and Social Problem," and to The Road to H (1964), coauthored with D.L. Gerard, R.S. Lee, and E. Rosenfeld. Dr. Chein particularly urges the reader to refer to his article titled "Psychological Functions of Drug Use," in Scientific Basis of Drug Dependence: A Symposium, edited by H. Steinberg (London: Churchill), 1969.

What, then, do we know about the juvenile drug user and the path he followed to addiction?[1]

SOME BASIC FACTS

Every year, several hundred new cases of young men (aged 16 to 20, inclusive) who are involved with narcotics become known in New York to the city courts, the Probation Department, city hospitals, and the Youth Council Bureau. The majority of these cases are users of heroin; only a few are nonusing sellers of heroin or are involved exclusively with marijuana. These figures, however, give only a minimal estimate of the true incidence of drug involvement.

Drug use among juveniles flourishes in the most deprived areas of the city. The incidence of illicit narcotics use on the contemporary urban scene is associated with the distribution of conditions of human misery, in almost any way that you might define the latter. It is overwhelmingly, though not exclusively, concentrated in areas of the city that are underprivileged in virtually every aspect of life that could possibly be relevant and on which there are data from which to derive indexes. These areas are also obviously underprivileged in ways that we do not index, e.g., with respect to quality of housing and of educational facilities.

The chronic users come not only from the worst neighborhoods, but from homes where family life is most disrupted, where the population is of the lowest socioeconomic status, and where there are highly concentrated ethnic groups who are often discriminated against. Despite efforts to discover concentrations of young users from less deprived areas, all available evidence pinpoints drug use among juveniles as a type of behavior characteristically associated with neighborhoods of gross socioeconomic deprivation.

Drug use leads to a criminal way of life. The illegality of purchase and possession of opiates and similar drugs makes the drug user a delinquent ipso facto. The high cost of heroin, the drug generally used by juvenile users, also forces specific delinquency against property, for cash returns. The average addicted youngster is too young and too unskilled to be able to support his habit by his earnings. Not only have many users freely admitted having committed crimes like burglary, but there is also independent evidence that in those areas of the city where drug rates have gone up, the proportion of juvenile delinquencies likely to result in cash income has also gone up, while the proportion of delinquencies which are primarily behavior disturbances (rape, assault, auto theft, disorderly conduct) has gone down (Research Center for Human Relations 1954b). Available knowledge about the behavior of drug users in juvenile gangs also indicates that they show a preference for income-producing crimes, as against participation in gang warfare, vandalism, and general hell-raising (Research Center for Human Relations 1954c). It takes most youngsters who eventually become addicted several months, sometimes a year or more, to change from the status of an occasional weekend user to that of a habitual user who needs two, three, or even more doses a day (Research Center for Human Relations 1957a). Many occasional users never take the crucial step to addiction, with its physiological manifestations of dependence, increasing tolerance, and withdrawal symptoms. Thus, we must distinguish between experimentation and habitual use, and, correspondingly, between factors conducive to experimentation and factors conducive to habituation and addiction.

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[1] All but one of our studies were focused on males. However, what we have had to say about the personality problems of drug users and what is needed for their cure and rehabilitation may well be equally applicable to users of both sexes and varying ages.

Youngsters who experiment with drugs know that what they are doing is both illicit and dangerous. While they may not be fully aware of all facts about addiction, they are likely to have seen addicts and certainly have heard about addicts being jailed, about the pains of withdrawal, and about the high cost of drugs. One would expect, therefore, that willingness to experiment with an illegal and dangerous activity presupposes a certain attitude toward one's self, one's future, and the society.

And indeed we find that chronic addicts, as people, tend to be characterized by certain personality deficiences and by hostility to society. They suffer from exceptionally low panic and frustration thresholds when confronted by the demands implicit in enduring intimate relationships or, for that matter, in any time-consuming responsible activity, or even when confronted by the likelihood of such demands. They are afflicted by a profound distrust of their fellow human beings, comprehending interpersonal relationships exclusively in terms of conning, manipulating, and pushing other people around. Among the things these young addicts want "much more than almost anything else in the world" is "to be able to get other people to do what you want," and "to enjoy life by having lots of thrills and taking chances." Their characteristic mood is suffused by a sense of futility, expectation of failure, and general depression.

What are the factors involved in the generation and perpetuation of the kind of person represented by the typical young addict? If you think of the including society, the ethnic group, the neighborhood, the family, the school, the person as he goes through his various developmental phases, and if you consider almost any pair of these, you find a vicious cycle generating the personality type or the conditions that breed the type. There are, of course, many instances in which particular circumstances break the cycle or even generate a contrary, beneficent cycle. We will discuss these circumstances later in this paper. But first let us examine the situations which are likely to lead to adolescent drug addiction.

Conditions within the family, the lifestyles of his peers, and the school he attends all influence the young urban male and make it probable or improbable that he will become a drug addict.

It is not surprising that the urban slum is a particularly good breeding place for families in which the parents, assuming that this basic family unit has managed to remain intact, are so preoccupied and fatigued by their struggles to keep their own heads above water that they have little time, patience, or perspective to deal with their children as human beings rather than as instrumentalities and sources of frustration; in which fathers have been so emasculated by their own incompetencies and dearth of opportunity as to be unable to set an appropriate model of the male role; in which momentary moods rather than stable patterns of personal relationships govern the application of reward and punishment and the demands made of the child; in which society, its institutions, and its institutional representatives are regarded with suspicion and distrust; in which hopes for the future take the form of unrealistic dreams and in which there are no realistic aspirations for or expectations of the child.

It is precisely from such families that chronic addicts tend to come. From this background they emerge into the larger world of the street and the school. In this larger world, they find the basic lessons of their earlier childhood reinforced in various ways. In school, they are misfits, taught frequently by inexperienced teachers who tend to look at them as incorrigible and unteachable. In the streets, they hang around aimlessly, dreaming of an affluent life achieved effortlessly, gravitating toward the delinquent subculture, but, as a rule, lacking the inner resources to become effective delinquents. Such boys are likely to have a favorable attitude toward the use of drugs. Abandoned at the threshold of a frightening adulthood by their more successful peers, narcotics offer them relief, an alibi, and a way out. In the deprived areas of a city there are sizable minorities of such youngsters. In some subgroups, this delinquent orientation is even more widespread, although not all delinquents become drug addicts.

Not all delinquents become drug addicts, and not all young boys who grow up in slums, even in the most economically deprived families, become delinquent. It is not easy to escape the pull of the delinquent subculture. The child who succeeds is the one whose initial autonomy is great enough or whose early family environment is wholesome enough, or who, in his early school years, encounters teachers who are sensitive and encouraging. Such a child is more likely than those in otherwise similar circumstances to pass successfully what Erikson (1950) has described as the developmental hurdle of establishing basic trust. Having done so, he is more likely to benefit from such favorable opportunities as may present themselves, to develop competencies and confidence, to become independent of the slum environment, and to establish relationships with wise and sympathetic adults who can help him through crises.

In deprived areas, many youngsters with a delinquent attitude toward life become members of street gangs. However, none of the juvenile gangs we studied was organized to sell drugs. Since most of these gangs were the most troublesome ones to be found in the high drug use areas of the city and they engaged in many gang-sponsored illegal activities, this finding makes it most unlikely that juvenile street gangs operate on an organized basis to recruit users.

Most gangs set limits on drug use by their members. The majority of the members of most of the gangs we studied were either opposed or ambivalent to the use of heroin. However, use of heroin among gangs is by no means rare, and the smoking of marijuana is extremely common. The general attitude seems to be that it's okay to use heroin "as long as you make sure you don't get hooked" (Research Center for Human Relations 1954c). The reasons why gangs seem to resist the spread of immoderate drug use in their midst are practical, not moral. An addict is thought to be "unreliable on the job," and, also, able to get the whole gang into trouble if they are all arrested together. Moreover, users tend to form little cliques that threaten the cohesiveness of the gang. For these reasons, a gang leader who starts to use drugs is likely to be demoted. To the gang members, the habitual use of drugs and their kind of "acting out" delinquency are incompatible. In line with this attitude, a pusher who is a member of a gang will not tempt a vulnerable fellow member, but will have no hesitation about tempting a nonmember or a member of another gang.

Most boys who grow up in deprived areas are exposed to drugs. A great many experiment with their use. From whom do they get their first dose? Contrary to widespread belief, most addicts were not initiated into the habit by an adult narcotics peddler. Only ten percent of the addicts whom we interviewed received their first dose from an adult. The overwhelming majority of the boys took their first dose of heroin in the company of a single youngster in their own age group or while with a group of teenagers. This first trial of narcotics was free to most of the boys (Research Center for Human Relations 1957a).

Getting the first shot of narcotics on school property was the exception rather than the rule. In fact, most of the boys did not try heroin until their last year of school or later (Research Center for Human Relations 1957a). That first dose was most often taken in the home of one of the boys, although a large number first try heroin on the street, on a rooftop, or in a cellar. Frequently the first dose is taken shortly before going to a dance or party, presumably because the youngster thought it would be a bracer, giving him poise and courage.

But not all juveniles who try heroin become habitual users, and not all habitual users become true addicts; that is, they are not hooked, not dependent on the drug.

A juvenile drug user is by definition delinquent, since drugs are illegal. But among drug users, some were delinquent before they began using drugs, and others became delinquent in order to support their habit. We know that the typical user lives in a poor, disorganized neighborhood. But our research shows that the drug user who was not delinquent prior to becoming a user is likely to come from a family of slightly higher socioeconomic status than the users who were also otherwise delinquent. For the sake of convenience, we can speak of them as delinquent and nondelinquent users. It is probable that these two groups differ in certain aspects of their personalities, but all we can say at present is that the nondelinquent users appear to be somewhat more intelligent and more likely to remain in school beyond the tenth grade. They are also somewhat more oriented toward the future.

But all juvenile addicts are severely disturbed individuals. Psychiatric research into the personality of juvenile opiate addicts indicates that adolescents who become addicts have major personality disorders (Gerard and Kornetsky 1955). These disorders were evident either in overt adjustment problems or in serious intrapsychic conflicts, usually both, prior to their involvement with drugs. Although there are marked individual differences, a certain set of symptoms appears to be common to most juvenile addicts: They are not able to establish prolonged, close, friendly relations with either peers or adults; they have difficulty in assuming a masculine role; they are frequently overcome by a sense of futility, expectation of failure, and general depression; and they are easily frustrated and made anxious, finding both frustration and anxiety intolerable. One may say that the potential addict suffers from a weak ego, an inadequately functioning superego, and inadequate masculine identification.

One would expect that such serious personality problems would be acquired in the family setting. And as we stated earlier, this is indeed the case. Addicts are most likely to come from families which are not only economically deprived, but families in which relations between parents are seriously disturbed, as evidenced by separation, divorce, overt hostility, or lack of warmth and mutual interest. As children, the addicts were either overindulged or harshly frustrated. Moreover, the parents are either pessimistic about their own future or have the fatalistic attitude that life is a gamble (Research Center for Human Relations 1956). They are also distrustful of representatives of the society such as teachers and social workers. This combination of attitudes toward themselves, toward society, and toward the boy are almost certain to undermine his confidence in himself and dampen whatever ambition and initiative he might otherwise have. With such a background, and without familial support at adolescence, it is not probable that the boy will have the strength necessary to stay away from the delinquent subculture by which he is surrounded.

The potential addict is much like the delinquent gang member in his activities, interests, and attitudes. But many gang members, as they approach adulthood, make their peace with society, find jobs, steady girlfriends, and so on. But for the potential addict, with his weak self-confidence, the need to face adulthood creates the additional stress which often precipitates the onset of drug use. We know, for instance, that the age of 16 is of special importance in the process of addiction.

Heroin reduces the pressure of the addict's personal difficulties. The positive reaction to a drug is not always immediate, but the addiction-prone youngster will try again, hoping to capture the experience of feeling "high," of increased confidence, of the serenity and relaxation he can observe in the behavior of regular users. And the weaker the youngster's ego, the more likely he is to become an addict. While the less severely disturbed youngsters are satisfied with an occasional shot, the unhappy, anxious ones learn to use the drug as a means of relief from their everyday difficulties. In a less direct but more pervasive way, the use of the drug plays a malignantly adaptive function in their lives by making it easy for them to deny and to avoid facing their deep-seated personal problems. The drug habit is a way of life which takes the user outside real life. The habitual user of heroin spends a good deal of time procuring and taking his daily doses; he becomes less interested in sports, girls, parties.

This picture of the addict, or the addiction-prone youngster, is rather a general one. There are, however, different kinds of narcotics users. These groups are not sharply differentiated, and little research has been done on them. One of my students, however, has found evidence of differences between two of the types. I believe that the consideration of what is involved in these differences is quite central to much of the discussion of treatment approaches.

There is an amazing paradox in the English treatment system. The addict within the system is limited to maintenance doses. As a consequence of tolerance, he should be having no effects other than the prevention of withdrawal symptoms. Why not, then, get himself humanely detoxified and continue without the threat of sudden withdrawal? Obviously, the addict who stays in the system is getting something out of it that has nothing to do with the psychopharmacological effects of the drug.

In America, too, severe withdrawal reactions among heroin addicts have become quite rare. Many boys, for instance, when deprived of drugs because of some sort of detention, go through so mild a reaction that the authorities do not recognize them as drug users. The cliche is that the real dosage levels in available heroin are so low that no severe physiological dependency develops. Most users, however, continue to take drugs, even if they seem to get little out of it.

From the viewpoint of the abuser of drugs, there are three major kinds of motivations: the psychopharmacological effects of the drug, motivation that has to do with the taking of the drug rather than its effects per se, and motivation that has to do with the counternormative behavior involved. An individual addict may be responding to one, two, or all three of these motivations.

The important psychopharmacological effect sought--especially with the opiate drugs--is, I believe, detachment, not oblivion nor the clouding of consciousness nor euphoria, and certainly not vivid hallucinatory experiences, but rather the relief from overwhelming distress that comes with detachment. To be able to get this kind of relief, the dosage levels must exceed the levels of physiological tolerance. Evidence indicates that for most contemporary, urban addicts, this effect of the drug is, at most, a relatively minor asset.

Of the three possible motivations for drug use, the one I believe to be the major factor in chronic urban opiate users is that taking it provides social benefits that are an answer to emptiness. There are three interrelated benefits the addict acquires from his involvement with narcotics: He gains an identity, one posing little to live up to. He gains a place in a subsociety where he is unequivocally accepted as a peer, a not-too-demanding place among his fellow men. He acquires a career, at which he is reasonably competent, devoted to maintaining his supply, avoiding the police, and the rituals of taking the drug. If he is arrested, this provides an alternate phase of the identical career. In the institution, whether jail or hospital, he still has his identity and after a time may become a model and guide to newcomers. If, in the institution, he has no great need for the drug, it is because his other needs are being met. It is not he who has changed, but his situation, and only temporarily.

The third motivation mentioned, that having to do with counternormative behavior, is seen in individuals who are deeply alienated from society, but who have sufficient inner resources left to want to hit back. For such persons, drugs, any drugs, are attractive precisely to the extent that their use is frowned upon, condemned, and persecuted by the representatives of the respectable society.

Incomplete Mourning and Addict/Family Transactions

A Theory for Understanding Heroin Abuse

Sandra B. Coleman, Ph.D.

INTRODUCTION

Recent developments in the drug abuse field suggest that drug-taking behavior is a function of certain variables that emerge from the psychosocial environment of the family. Rather than focusing on individual dynamics as the source of one's need for drugs, the family's interlocking, transactional patterns are considered essential elements of compulsive drug abuse. Theoretical explanations indicate that drugs play an important role in maintaining family homeostasis or equilibrium. As a subset of psychosocial theory, family systems theory explains how the family encourages, reinforces, and sustains drug-seeking behavior (Harbin and Maziar 1975; Klagsbrun and Davis 1977; Seldin 1972; Stanton 1979d).

The theoretical perspective presented in this chapter is derived from family systems theory; it includes major constructs, such as homeostasis, role selection, intergenerational boundaries, etc., and their specific adaptations to the drug abuse field (Steinglass 1976; Stanton 1977a; Stanton and Coleman 1979; Coleman 1979a). This model focuses on death, separation, and loss as significant precursors of drug abuse, given the necessary addiction-producing elements of family behavior (Stanton 1977a; Stanton and Coleman 1979; Coleman 1979a).

Because the family, rather than the individual, is the designated patient, the term "drug addict family" is used to refer to those families in which at least one member is engaged in compulsive drug use in a manner that suggests physical and psychological dependency. The general focus is on narcotics addiction--mainly heroin--and the distinguishing death-related family processes and properties that appear to be associated with it.

Specifically, this theory of drug addiction suggests that the addictive behavior is a function of an unusual number of traumatic or premature deaths, separations, and losses which are not effectively resolved or mourned. The homeostatic family processes and feedback mechanisms make heroin abuse a likely response for coping with the overwhelming stress associated with the loss experience. Drug use further serves to keep the abusing member helpless and dependent on the family, a process which unifies and sustains family intactness. Within the complex set of interlocking behaviors, there is an overall sense of hopelessness and a lack of purpose or meaning in life which accompanies the repetitious cycle of family transactions.

THEORY OVERVIEW

DEATH AS A PSYCHOSOCIAL ISSUE

Death has conventionally been regarded as the logical cessation of life, the other end of the birth phenomenon. Except for its relationship to theological issues and philosophical thought, death was associated most often with the terminally ill or the elderly. In recent years, however, views of death have changed. In the late 1960s, Kubler-Ross undertook her classic study of dying patients and delineated four stages which terminal patients seem to experience prior to their death. Subsequently, she expanded her original work and presented her view of death as the final stage of human growth (1975). This idea of death as an integral part of life was shared by Becker (1973), the major theme of his psychological mystico-religious writing being that death served a central function to all mankind.

Beyond the view of death as an individual experience is the concept of death in its social context. Some years ago, Hamovitch (1964) and Wahl (1960) suggested that the family system of the dying person had not been given enough attention. The dying person does not die alone but in relationship to others--family, friends, etc. (Pattison 1977). Kastenbaum and Aisenberg (1972) propose that the dying member assumes special status in the family and may even serve as a symbolic representation of all of the family's deceased ancestors. They give particular attention to the social participation imposed by death, a view first expressed by Slater (1964), who was intrigued by the way people surround the corpse at a funeral, giving it love and attention. Kastenbaum and Aisenberg add to the notion that death accelerates group interactional processes by noting that the dying person also participates in idiosyncratic rituals related to the terminal condition. This causes the dying person to become a participant in his or her own death. The authors feel that the closer one is to death, the greater the probability of becoming an active part of the process.

The functional or purposive nature of death suggests that it may precipitate additional types of behavior. Recently, Eisenstadt (1978) proposed a theory of the eminence of genius as a consequent of parental bereavement. Eisenstadt states that there is a creative mourning process that "is related to a sequence of events whereby the loss triggers off a crisis requiring mastery on the part of the bereaved individual. . . . If the crisis is worked through, that is, if the destructive elements and the depressive features of the experience of bereavement are neutralized, then a creative product or creatively integrated personality can result." Eisenstadt suggests that a major intervening variable between the death of a parent and the desire for fame, eminence, and occupational excellence is the nature of the family unit prior to the disruptive period preceding the death. The author offers support for his theory by reconstructing parental loss profiles of 699 eminent persons who experienced early loss of one or both parents. Comparative orphanhood data from the general population, i.e., actuarial information, indicated that the eminent group had a considerably greater degree of parental loss. Comparisons with delinquent groups, however, showed that they were orphaned at rates comparable to those found among the eminents. Thus, Eisenstadt suggests that the critical issue is not necessarily the loss itself but the way it is mastered; the eminent group seemed to invest considerable energy in intellectual pursuits, which may represent one creative approach to coping with bereavement.

The important question arising from Eisenstadt's theory is, what happens when bereavement is not mastered? The delinquency data suggest that the inability to mourn creatively may well be a function of family characteristics which emerge at the time a member dies. If this is the case, the important variable is not death but the family transactions and interrelationships that lead to the successful or unsuccessful resolution of death.

Death, Loss, and Separation

Background. The basic tenets of the present theory were developed several years before Eisenstadt's work was published (Coleman 1975), but the central concepts are remarkably similar. The foundation of this theoretical model lies in a study that I began in the early 1970s. From doing therapy with recovering heroin addicts and their families, I observed somewhat serendipitously a recurring pattern of unusual deaths which had occurred many years earlier, yet which still seemed to have profound effects on the surviving family members. This led to a pilot investigation of the histories of 25 drug addict families, the primary purpose of which was to determine the prevalence of death in two generations, i.e., the family of procreation and the family of origin. Severe or life-threatening illnesses were also studied because critical illness is so often followed by death. Only the untimely, premature, or unexpected deaths were quantified; deaths resulting from normal aging processes were not included in analyzing the data. Thus, the majority of deaths included in this study took place during the addicts' or parents' developmental years. Results indicated that some families felt the impact of more than one death; 18 (72 percent) experienced at least one traumatic or unexpected loss of a loved one. Seventeen (68 percent) were witness to a severe or unusual illness, and a similar number of families had an alcoholic parent or sibling in either of the two generations studied. When the variables were combined, 13 families (52 percent) experienced death and severe illness, and 12 families (48 percent) were found to have death and alcoholism in their backgrounds. Eleven (44 percent) of the families had a combination of illness and alcoholism, but when alcoholism was subsumed under the category of illness, there were 24 families affected. The latter figure suggests that 96 percent of all the families studied were in some way affected by either alcoholism or some other chronic debilitating illness. Nine families (36 percent) experienced a combination of death, illness, and alcoholism. Although this was not a controlled study, these data suggest that this is an area that needs further systematic investigation.

Further clinical evidence of the significance of death to addict families emerged from findings that death and death-related issues were major themes in my group therapy sessions with siblings of recovering addicts (Coleman 1978a,b). In addition to talking about death, this small group of 20 preadolescents experienced several traumatic family deaths during the course of the two-year project.

Supporting Research. A comprehensive review of the literature on death, separation, and loss appears in previously published literature and will not be elaborated upon here (Coleman and Stanton 1978; Stanton and Coleman 1979; Coleman 1979a). It is important to emphasize, however, that there are three central sources of support for viewing death and death-related phenomena as major theoretical components.

The first is that addict deaths at an early age occur relatively often, suggesting that there may be an intrinsic suicidal element (Coleman and Stanton 1978; Stanton and Coleman 1979). The discrimination between intentional and accidental drug overdose is difficult and goes beyond the purpose of this chapter; however, it is important to note that death is a frequent corollary to drug-abusing behavior.

In addition to the statistics on addict deaths, and more central to this theoretical position, is the degree to which an unusual number of untimely deaths occur among addict family members. Supportive evidence for the data presented in the pilot study discussed earlier (Coleman 1975) indicates that there is a high incidence of early loss of at least one of the addict's parents due to death (Ellinwood et al. 1966; Blum and Associates 1972b; Miller 1974; Harbin and Maziar 1975; Klagsbrun and Davis 1977). It is interesting to note that a more recent study on treatment outcome (Harris and Linn 1978) found that one of the few background characteristics that significantly differentiated heroin addicts from nonheroin drug users was that the heroin addicts were more likely to have experienced the death of their fathers before the age of 16.

Second, the prevalence of death symbols further reflects the unique role which death plays in addict families. From my study of the roles, communications, and interactions within the 25 families (Coleman 1975) three symbolic, death-related phases could be distinguished on the addiction continuum, i.e., the imminence of death (early drug use); the funeral (removal from the home to a residential therapeutic community); and the resurrection (family treatment). In this sense addiction is analogous to a slow dying process. Coleman and Stanton (1978) suggest that addiction facilitates the family's death-related participatory behavior. By treating the drug abuser as if he or she is going through a slow, tedious death, the family members are able to perpetuate (vis-a-vis the addict) the premature and unresolved death of a former member. The addict thus becomes a substitute or revenant of the deceased. This is consistent with Stanton's (1977b) view of the addict as the sacrificial member who martyrs himself/herself in order to fulfill the family's need for a death. Stanton considers that the addict's role as "savior" allows the family to become mutually involved in a suicidal conspiracy.

Finally, in addition to separation caused by real death, any type of familial disengagement is particularly difficult for addict families. Stanton (1977a, 1979d) and Stanton and Coleman (1979) have written extensively about the conflicting elements of separation and doubt that it is mere coincidence that drug use becomes intensified during adolescence when separation conflicts are at a peak. As Stanton et al.

(1978) point out, heroin abuse is a "paradoxical resolution" to growing up and leaving the family. The drug permits the user to leave as a means of establishing some independence, but it also facilitates the return to the hearth when it is time to "crash." This perpetuates the cyclical pattern of leaving and not leaving, keeping the heroin addict straddled between home and the outside world of drugs. The profound conflict which separation presents for these families has been discussed extensively in other publications.

Religiosity and Philosophical Meaning of Life

Akin to exploring the role of death in addict families is the investigation of the function of religion[1] in family life. The family's religious beliefs or philosophical systems of thought are apt to be the major interface between death and the future pattern of adaptation. A sense of faith may either alleviate or exacerbate the concomitant sorrow, rage, and guilt that accompany or follow the loss of a loved one. Feifel (1959) feels that, in addition to other factors, one's religious orientation and coping mechanisms are strongly related to that individual's personal reaction to death. The major thesis underlying Frankl's (1963) logotherapeutic system is that the primary life force is the search for meaning. He suggests that the loss of feeling creates an "existential vacuum" in which one lacks a rationale for living, thus creating hopelessness and despair. He even explains alcoholism as a function of the "existential vacuum" and further suggests that the frustrated will to meaning may be compensated for by the substitution of a will to pleasure. Could one then suppose, in view of such a theoretical premise, that drug addiction is also a means of coping with the spiritual void?

In Blum and Associates' (1972b) study of high- and low-drug-risk families, the role of religion was found to be significant with respect to the developmental trend of its inception. For example, high-drug-risk families were uncertain about their belief in God and tended to allow their children to determine their own beliefs. As the children began to reach preadolescence, however, the parents became worried and began to consider forcing their children to become exposed to formal religion. In contrast, the low-drug-risk families affirmed a strong belief in God's existence during the early childhood years but after adolescence did not insist on church attendance. They felt that they had instilled the foundations for belief and were not preoccupied with religious participation, per se. It is important to note, however, that Blum and Associates' definition of religion is a traditional one and refers to church attendance and formal doctrine as opposed to the broader concept used in the present theory.

Although these findings are interesting, it is felt that the nature of the interactions between child and parents is perhaps more important than the specific religious practices in which they are engaged.

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[1] Religion, or religiosity, as used here extends beyond formal doctrine and includes any system of philosophical belief which represents a specific view about the meaning of life. Thus, the term "religion" embraces a sociological view or weltanschauung that includes the conceptualization of the purpose of one's existence. This is considered as one of the motivating forces which guide purposive behavior--an internal determinant, to some extent, of one's life process.

Kastenbaum and Aisenberg (1972) relate object loss, in the form of death, to alienation from God in that significant loss tends to increase the fear of further loss. In addition, they suggest that the fear of what happens after death can be involved with the threat of punishment. Such fears can result in severe alienation from God and religion, which again impinges on the role of rejection. The loss or lack of a belief system may, especially in conjunction with the loss of the loved one, produce even more feelings of despair, helplessness, and loss of power, thus reinforcing the depressive state. In a study focusing on religion as a critical influence on attitudes toward death among religious and nonreligious students, Alexander and Alderstein (1959) found some significant differences, yet failed to find the anticipated degree of variance. The authors explained the results as indicating that both groups had a religious belief system and were not in doubt or conflict about their religiosity.

Although some of the evidence is still inconclusive, there is overall consensus that, with regard to alcohol abuse, religions that support abstinence are apt to have fewer problem drinkers among their populations (Maddox 1970; Snyder 1958; Gusfield 1970). Even more significant than doctrinal orientation toward alcohol is the evidence that religion is a consistent predictor of those who can be expected not to use drugs. Although the data have not sufficiently explained the reasons for the relationship between religion and drug use, the association between the two is supported by results from a relatively large number of investigations (Gorsuch and Butler 1976a). These authors suggest that the correlation between religion and abstinence may be due to the fact that an individual's basic needs are most likely to be met by traditional parental socialization factors, which generally include the institution of religion. This conclusion appears even more likely when it is considered in conjunction with Blum and Associates' (1972b) findings that youngsters from traditional families, regardless of social class, race, or ethnicity, are least apt to engage in drug usage.

The drug experience itself is steeped in what might be considered a hybrid version of contemporary religion. The administration of drugs is surrounded by ritual, including verbal and nonverbal gestures, music produced by instruments that emit unique, captivating, and haunting sounds and an aura of mystical sacrifice. The spiritual state that evolves during the "high" imposes a sense of love, awareness, and communion. Perceptions are heightened during intense drug experiences which alter the state of consciousness and create a sense of being at one with others and with nature. These rites can readily be compared with traditional religious ceremonies or services and the powerful gestures of the priest, minister, or rabbi in regal garb. The experience derived from the induction of drugs simulates the effect of the choir and the resonating organ.

It is also important to consider some of the recent treatment alternatives for drug addiction. Religious groups such as Hare Krishna and the born-again Christians are often successful in converting the drug addict into a religious advocate. The strength of newfound "religions" in diminishing drug use indicates that, at least for some addicts, adopting a belief can make an important difference. The fact that the Eastern religions tend to dominate is particularly pertinent. This may be due to the fact that Eastern philosophy is more readily integrated into one's daily life.

Whether or not one believes in God, Christ, Buddha, or any other formal deity or doctrine is not felt to be as significant as the fact that a spiritual philosophy has been personally derived. As Alexander and Adlerstein (1959) noted in their study, death anxiety was not that different between religious and nonreligious groups. This leads to the postulate that belief in any system--deism, atheism, etc.--is in itself a resolution and represents a philosophical-religious construct regarding life and the meaning derived from one's life experiences. The lack of such a system is then similar to being noncommitted, which can lead to feeling helpless, powerless, and frustrated. If the loss of a significant loved one results in a sense of loss of a viable self as well as the loss of belief in a viable other, including God and/or spiritual faith, then it is logical to assume that there may be a loss of total meaning to one's existence, so that drugs may represent a search for and a defense against one's own mortality.

Certainly one's value system and one's religious orientation evolve from within the family system. In order to understand how families respond to death and loss, the family value system regarding the philosophy of life needs exploration.

SPECIAL POPULATIONS

The extension of the incomplete loss theory to other populations gains support from a national drug abuse survey (Coleman 1976; Coleman and Davis 1978), where separation and loss were reported as relevant issues in many families. Further comparison of characteristics of drug abusers from multiethnic families suggests that a common element is that of loss and separation due to divorce, marital breakup, or death. One of the most striking types of loss exists among the Navajo, who are in danger of losing their religious rituals to the new revivalist sects. One sensitive worker has said, "Unless the Indian can keep his rituals, he will most assuredly die" (Coleman 1979b). A dispute with the Hopi also threatens them with a severe land loss and concomitant deprivation of large numbers of livestock. Navajo counselors feel that the stripping of cultural needs exacerbates and contributes to addiction.

SUMMARY

In summary, this theory is based on the premise that death, separation, and loss are significant etiological factors in heroin-addict families. The death and death-related variables are integral parts of a homeostatic pattern that keeps the drug-abusing member helpless and dependent on staying at home with the family. Within the complex set of feedback mechanisms involved in the drug-taking process lies an overall sense of family hopelessness and lack of purpose or meaning in life which accompanies the repetitive drug-sustaining cycle of family interactions.

The Social Deviant and Initial Addiction to Narcotics and Alcohol

Harris E. Hill, Ph.D.

Generally research on the addictions has been concerned with various phases of chronic intoxication and relapse, or with behavioral changes that accompany these phases of addiction. The present suggestions, on the contrary, are mainly directed toward study of the development of initial addiction and the possible significance of social deviance and the psychopathic personality in this process. Definite evidence of social pathology in all preaddiction personalities is lacking. There is now good reason to believe, however, that in the United States all alcoholic and narcotic addicts studied as groups show social deviance as the only common characteristic, and that this characteristic existed prior to addiction.

For the present discussion it will be assumed, in contrast to views such as those stated by Lindesmith (1947), that alcoholics and narcotic addicts in general are social deviants prior to the initial addiction. This does not imply that all such individuals are aggressive and antisocial. In this respect it is perhaps unfortunate that "psychopathic deviate" was used as a label for this scale of the MMPI which differentiates at a high level between individuals who are fairly well adjusted in our society and those who exhibit a diverse array of social pathology. It may be that a generic term, such as "conduct disorder," would be more appropriate (Hill et al. 1960; Meehle 1956). Cameron and Magaret (1951) cogently state that although some social deviants are aggressively antisocial, many are simply "inept" or "inadequate" personalities.

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The present discussion of the social deviant is an attempt to discover more fully the behavioral characteristics which make him uniquely susceptible to the effects of narcotics and alcohol. Identification and classification of deviant attitudes and overt responses appears to be the most critical and the most difficult task to accomplish in research on the psychopath. If this could be done with even a fair degree of success, criteria might be available for the study of antecedents, for the prediction of behavioral trends which result from particular antecedents, and for the prediction of specific drug effects which are acceptable and desirable to particular personalities.

There appear to be several powerful interacting factors which determine the vulnerability of the social deviant to initial addiction. The first, which has been discussed at some length by others, is that such behavioral equipment is found most frequently in the underprivileged and slum areas in which opiates and other drug supplies have "high" availability (Chein and Rosenfeld 1957; Cohen 1955; Clausen 1957) and in which both narcotic addiction and alcoholism are common. The environmental conditions which produce the deviant in these areas also provide more ready access to opiates than in the larger society, and with regard to both opiates and alcohol, provide a greater degree of exposure to models of excessive use. But, to a more limited degree, this would appear to hold also for the social deviant in all societal strata. Secondly, lack of social controls (shared responses) appears to determine the degree of acceptability, to the deviant, of experimentation with drugs as well as with other forms of unusual behavior (Chein and Rosenfeld 1957). Although a certain degree of privation and social isolation in the "fringe" areas are contributing factors to social deviance as well as to addiction, they appear to be neither necessary nor sufficient causal antecedents of such behavior. The descriptions given by Chein and Rosenfeld (1957) and by Clausen (1957) of nondelinquent nonaddict adolescents and their families resident in deprived areas suggest that familial discipline, and inculcation of other shared responses, such as a variety of interests and activities, provide deterrents to the use of drugs and other deviant behavior. In contrast, but in keeping with the psychopath of the deprived areas, the social deviant of the middle class, while not deprived ecologically, usually has a family background which provides inconsistent or unrealistic discipline and little consistent warm guidance in developing interests. Thus when adolescence and, finally, adulthood arrive, individuals have not developed behavior which is appropriate for either their status or their age, and could not be expected to exhibit social controls which they have not acquired.

It seems reasonable to assume that the degree of social deviance exhibited by an individual is a measure of the effectiveness of his social controls, and that the degree of such effectiveness is determined by the development of preferences and inhibitions which are held in common by the larger society. The social deviant is deficient in reactions of self-criticism, counteranxiety, or "guilt" which might deter unusual behavior. Since the social deviant is deficient in these social values or shared responses of the larger society, counteranxiety is low and retrial or continuance of the use of drugs is acceptable.

In addition to being deficient in social controls, the deviant appears to be more accepting of short-term satisfactions, or at least less able to defer short-term gains for long-range satisfaction. Few experimental but many clinical data indicate in this regard that the social deviant does not gain the degree of satisfaction (reinforcement) from daily pursuits that the "normal" individual does (Chein and Rosenfeld 1957; Cohen 1955; Clausen 1957). Stable interests which provide continued reinforcement were found to be present in general in teenage nondelinquents who were not drug "users" but who lived in "high use" areas, whereas there was a paucity of such interests in comparable teenage addicts. The deviant thus appears to be more vulnerable to repetition and continuance of unusual activities that provide even temporary satisfactions. With fewer social deterrents to drug use, and concomitantly fewer satisfying daily pursuits, it would be predicted that drug-produced euphoria is more acceptable to and more easily induced in the deviant.

Euphoria as an acceptable drug effect is, clearly, not exclusively associated with social deviance--the functions of the cocktail party are not directed entirely toward business or political ends. At present, although few have difficulty in accepting clinical definitions and self-report, "euphoria" has no precise, scientific referent.

A considerable number of narcotic addicts state that their initial trial of opiates was extremely pleasant. Although an estimate of the proportion cannot be made at present, some of these individuals used opiates first to alleviate alcohol withdrawal symptoms. Other addicts maintain that their initial use of opiates was very unpleasant, but that through repeated trials the effects became very desirable. Continued use even makes vomiting a "good sick." It thus seems reasonable to assume that social deviants attain euphoria more easily than normal persons, since they find experimentation with drugs acceptable, and since acceptability, desirability, and euphoria are closely allied.

The above appear to be the chief factors which produce the special vulnerability of social deviants to addiction. They are deficient in daily pursuits which are reinforced by and bring satisfaction to the larger society; they are not deterred from unusual behavior by counter-anxiety, which in the "mature" adult can be partially identified as inhibitions; because of these deficiencies they are especially susceptible to short-term satisfactions, and if drugs are available they can themselves rapidly manipulate their personal state.

If these views have only partial validity the devising of such an ideal learning situation in the laboratory would be difficult. It must be considered, also, that both opioids and alcohol produce many effects, in addition to those mentioned, which may be desirable to social deviants but which do not seem to be peculiar to them.

The lowering of social controls and the production of euphoria by drugs has received little attention in the literature, compared to drug-produced alteration in pain and discomfort, anxiety and depression, and conflict and aggression. Since these latter effects presumably can be attained in the nondeviant individual (and the nonaddict), such effects per se do not appear to be the critical elements in the process of initial addiction. But an individual so unfortunate as to be socially deviant and at the same time either neurotic or schizoid is doubly vulnerable to addiction, since some indications of these tendencies can be altered by drugs (Haertzen and Hill 1959).[1] Unfavorable conditions are still further compounded when withdrawal symptoms appear which can be alleviated by continued drug use. With these additional factors, it would appear that no investigator, even in the most euphoric moments, has even approximated the devising of such optimal conditions for learning. With such an array of behavioral determinants, any learning theoretician could find support for whatever systematic position he or she wished to assume. It may well be that this concentration of reinforcements on one form of behavior--drug use--is partially explanatory of the strength of both alcoholism and opioid addiction, "loss of control" with respect to these substances, and the resistance of the addictions to therapy.

One of the most difficult problems in the etiology of the addictions, and one which apparently has a direct connection with specific effects of drugs, is concerned with the use of a particular agent when others are equally available. Alcohol and opiates, although having some effects in common, perhaps even some common effects on conflict and anxiety, frequently produce diametrically oppposite actions. Although no study is available which compares the initial use of alcohol and opiates in naive subjects, a not insignificant number of narcotic addicts report previous alcoholism. It is known also that initially the very great majority of narcotic addicts have experimented with alcohol and that it is as available to them, or more so, than are narcotics. Frequently they maintain that they become aggressive and assaultive, or comatose, under alcohol. To them, these effects are opposite to the preferred actions of the opiates. Especially in the social deviant alcohol may produce euphoria, reduce conflict, and make possible the occurrence of behavior which was inhibited by either conflict or counteranxiety. It thus seems apparent that alcohol and opiates differentially but specifically alter the probability of occurrence of particular classes of responses.

Briefly, in this connection, it is assumed for the general case that the behavioral equipment of the individual is composed of specific responses or response patterns which have certain probabilities of occurrence (strength) in any given situation. Since different responses of the individual differ in strength, they form a response hierarchy for a given situation ranging from the response which is most likely to that which is least likely to occur (Hull 1934; Miller and Dollard 1941). As an organizing principle in research on psychopharmacology, and for its applicability to the addictions, it is here hypothesized that drugs rearrange the individual's response hierarchy in ways which are specific for a particular drug and for a given situation. (Conger [1956] presented a somewhat similar formulation for some of the actions of alcohol.)

Psychodynamic mechanisms by which desirability (to the user) of drug effects are determined have been proposed by many, but few have focused on social deviance in this process. However, since deviants must live in a society to which they are not well adapted, they not only face the difficulties encountered by the average individual but

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[1] Probably both neurotic and schizoid tendencies involve anxiety and counteranxiety, but it appears evident that when these reactions are combined with social deviance, the inhibiting effects of counteranxiety are not as effective as are the reinforcing effects of the drug.

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also those imposed by their own differences and deficiencies in behavior. If it is postulated, as in the present paper, that certain drug-produced changes are acceptable to the social deviant, the previously given factor classification is suggestive of some of the alterations which might be desirable. Since some of the behavioral actions of narcotics and alcohol are known, it suggested that the immature, inadequate deviant who has not found independence in solving problems of adult life, may find in alcohol temporary independence from frustration, conflict, anxiety, and monotony, or in opiates nearly complete dissolution of such difficulties. While some of the same actions of these drugs would presumably occur in all deviants, the primary psychopath might be especially susceptible, depending on the degree of socialization, either to enhanced expression of hostility and aggression by alcohol, or to their elimination by opiates.

Framework for an Interactive Theory of Drug Use

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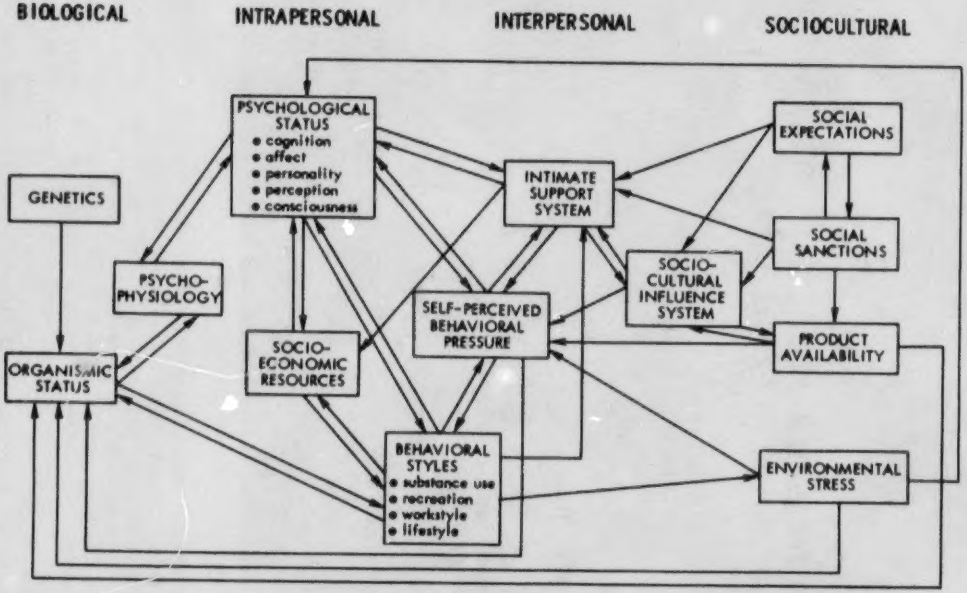
INTRODUCTION

Our theory of drug use takes the position that drug-taking behavior is caused by several large constellations of intraindividual and extraindividual forces. These domains of influences interact to modify each other while determining the presence or absence of a large variety of lifestyle behaviors, including drug and alcohol use. Many previous theories of drug taking have provided valuable contributions to the field and are correct as far as they go. Flaws in these theories stem less from incorrectness than from incompleteness; they focus on one set of forces to the exclusion of others. In order to provide a more comprehensive view of drug use than is typical, we will discuss the models or domains of influences which form the major subsystems in our larger theory, and then present more specific ideas on how different influences work to modify each other as well as to determine the performance of behaviors.

The detailed theory we will consider is presented graphically in figure 1. This diagram represents sets of influences as large boxes. We should point out quite forcefully that we believe each box represents many different variables, factors, or latent influences, some of which may be largely uncorrelated with one another; that is, what we have presented are relatively abstract domains of influences. In figure 1 we have also drawn a large number of single-headed arrows to signify presumed causal influences. Where no arrow appears, we believe that there is not a strong direct effect. While the mandated length of this chapter precludes a literature review, we should emphasize that most of the links have been substantiated empirically and are recognized as major conclusions by many researchers. The diagram is an abstract summary statement of our theory, which permits detailed empirical tests using a variety of research and analytic techniques, including the new methods for causal modeling with latent variables, a variety of continuous and discrete multivariate methods, and experimentation.

FIGURE 1.–*Framework for a theory of drug use*


BIOLOGICAL
INTRAPERSONAL
INTERPERSONAL
SOCIOCULTURAL
PSYCHOLOGICAL STATUS
• cognition
• affect
• personality
• perception
• consciousness
GENETICS
PSYCHO-PHYSIOLOGY
ORGANISMIC STATUS
SOCIO-ECONOMIC RESOURCES
INTIMATE SUPPORT SYSTEM
SELF-PERCEIVED BEHAVIORAL PRESSURE
BEHAVIORAL STYLES
• substance use
• recreation
• workstyle
• lifestyle
SOCIAL EXPECTATIONS
SOCIAL SANCTIONS
SOCIO-CULTURAL INFLUENCE SYSTEM
PRODUCT AVAILABILITY
ENVIRONMENTAL STRESS

Within the framework, we will try to claim a rather modest role for ourselves, if such a stance is possible given the grandiose nature of the figure.

FRAMEWORK

Having presented the model, we would like to digress somewhat and clarify several points about the framework we are suggesting for the development of a comprehensive theory of drug use. In general, we have attempted to integrate various major themes of research developed by previous workers. While the labels chosen for various domains of influence may not be entirely synonymous with the terminology used by specialists in different fields, we feel that the general set of domains can be differentiated into those variables addressed in studies that span disciplines from psychopharmacology to psychology, sociology, and economics. Second, the act of differentiation and greater specification in various systems is a desirable goal for both current research and future theory. We feel that systems of interest, such as personality, must be successfully charted by determining the major structural and dynamic components. Our current framework is a largely undifferentiated and unelaborated one which should develop naturally as more information about the various domains becomes available through basic and applied research in the major scientific fields of relevance to drug use. As a consequence, we expect that the future elaboration of our framework will possess some degree of ecological validity through empirical derivation rather than theoretical superimposition. Finally, we feel that the current framework allows the kind of differentiation which may permit confirmatory tests with such theory evaluation procedures as causal modeling with latent variables. That is, the current framework is explicitly designed to permit the comparison of various theories within a sophisticated, hypothesis-testing correlational methodology. While experimentation may well provide the best method for clarifying certain specific components of our model (e.g., the effect of certain products on various organismic variables), naturalistic research will be required to interrelate those many components that are not easily or ethically subject to manipulation (e.g., the effects of life stress on drug use) (Bentler 1978).

As this theory goes through successive generations of development there are several paths it must take. As a first task, we feel that within each domain there should be a clarification of major variables that are relevant to understanding drug use. There are certain domains which traditionally have been the province of a given academic specialty, and we feel it is important to combine information from various disciplines so that the sphere may be charted with a consentaneous set of structural referents. Second, we believe that there should be a focus on the development of various submodels within the more general framework. Indeed, there is probably a lifetime of research productivity involved in determining the major structural personality characteristics related to drug use. As information accumulates within each specialty area, we would wish to see further elaboration of the component systems. Third, there should be an attempt to integrate alternative empirical and theoretical systems into our overall concept. While we make no pretense of being able to explain all the phenomena of drug use, we propose the broad framework primarily because we hope that it has some potential for unifying more narrowly based concepts of drug use.

THEORETICAL ELABORATION

Turning away now from the abstract framework to the more detailed formulations we have chosen in our first attempt at theory, the reader will first note in figure 1 that we have included construct domains that do not directly influence either drug taking or its alternatives. We feel that it is necessary to include these more contextual domains in a theoretical and empirical specification so that we can assess indirect effects as well as derive unbiased estimates of the amount of their influence. Furthermore, we must remember that many different domains are changed directly and indirectly as consequences of drug taking and its alternatives. It is thus critical to consider the dynamic interactions of many different domains when considering drug-taking behavior.

A second major characteristic of our structural model is that the behaviors of drug and alcohol ingestion are embedded in a larger set of preferred behavioral styles which may complement or preclude one another. Indeed, it is necessary to speak of the psychosocial causes of drug taking and its alternatives because many of the alternatives share the same psychosocial causes and may bring the same consequences for the individual. The structural properties of individual behaviors must be considered within the interactive, ecological context of other characteristic behaviors performed and precluded so as to elaborate a theoretical network that has both convergent and discriminant validity.

At this time, we do not pretend to know whether it is more fruitful to approach a domain of behavioral styles from either dimensional or typological viewpoints. That is, we are not sure if there are delineable behavioral types or whether there are some major dimensions of behavioral perference and action. We do believe that it is important to know what other behaviors drug users also perform characteristically and to use co-occurrence with other behaviors as a way of differentiating among drug users. The present approach seems to open an avenue for conceptualizing other habitual behaviors, such as overeating, gambling, or obsessive shopping, in relation to the dynamic causes of drug taking. Our use of the phrase "behavioral styles" is meant to imply that the focus of our theory is on behavior that spans temporal and contextual effects. We are not particularly concerned with ad hoc and fleeting behaviors.

We are continuing to revise and expand the theoretical model. Consequently, the dynamic and structural properties implied by figure 1 should be perceived as a model in the process of evolution. Our goal is to develop and test many of the different submodels implied by the framework.

Proceeding to a detailed consideration of the figure, we have differentiated four major areas of interest at the highest level of abstraction. These are biological, intrapersonal, interpersonal, and sociocultural influences. At the very foundation of the biological area, we would place genetic influences. We also wish to differentiate a domain which we call organismic status and which includes such variables as health or efficient functioning as well as major anatomical and physiological systems. Those aspects of physiology directly confounded with the psychological status of the individual should be specified into a separate domain labeled psychophysiology.

Dynamically, we have posited that the organismic status is a function of genetic influences as well as psychophysiology and various behavioral and social forces. The dynamic lattice is presented in the figure as causal arrows. While there is residual, or unspecifiable, causation for each of the domains delineated, we have not indicated these in the figure. Specifying the nature of these residual influences is one of the major tasks to be completed in future generations of the present model.

Turning now to the intrapersonal sphere, we have been most concerned with differentiating those systems which comprise psychological status. We distinguish between subsystems of cognition, affect, personality, perception, and consciousness, each of which is a specialty area within the social sciences. Among the dimensions in the personality system that appear relevant to drug taking and its alternatives are extroversion, law abidance, social adjustment, rebelliousness, anxiety, sensation-seeking tendencies, and autonomy and achievement strivings. We should note, parenthetically, that any of several sets of "second order" personality factors are reasonable constructs, in toto, for affecting drug use behavioral styles.

Within the affect subsystem of psychological status, it appears that Tomkins' (1962, 1963) derivation of positive and negative affects and their relationship to cognition, perception, consciousness, and personality may be the most elegant. This theory has already proven useful in differentiating types of cigarette smokers. Constructs which must be considered as the cognition system (or cognitive style) of the individual include the deployment of attention, memory capacity and organization, various intellectual ability skills such as reasoning, hemispheric dominance, and level of cognitive development. Perceptual constructs of interest include attention utilization, figure/ground relationships, distinctiveness, and ambiguity. Within the area of consciousness, it may be fruitful to consider the dimensions of content and structure outlined by Huba (1980) as derived from the theoretical writings of Singer (1975). We realize, of course, that the study of psychological status is a complicated one, encompassing virtually the whole field of psychology, and we do not mean to oversimplify its importance within our diagram. On the other hand, when we try to conceptualize a very specific behavior such as drug use, or even a behavioral style which includes drug use, it may be necessary to use more abstract summaries of other domains so that they might all be included.

It also seems important to consider the socioeconomic resources of the individual when considering a dependent variable of behavior. Financial resources are a function of the individual's psychological status as well as various social-system variables. Socioeconomic resources, or status, will also have an influence on the individual's psychological status.

Among the interpersonal domains, we differentiate intimate support systems and sociocultural influence systems. We consider the intimate support systems to be family, friends, and significant others for the individual. Among the important aspects of the intimate culture are providing relevant, valued models and reinforcers for various behaviors and a sense of identity and belonging. We believe that the sociocultural influence system is a set of the more distal influences from the culture, including subcultural norms, models, and impersonal socialization influences such as advertising. These influence systems are central to the criminal justice system's belief in the efficacy of demand reduction methods through modifying the social environment of the drug user.

In the sociocultural domain, we distinguish social sanctions, social expectations, product availability, and environmental stress. The domain of social sanctions includes such forces as laws, reinforcements or punishments, rituals, trends, fads, prevailing mores, and modal behavior patterns within the society. Within the domain of product availability we would include dimensions of cost and accessibility. While this domain does not appear as a central focus of psychological theories of drug use, the supply reduction strategy of dealing with drug use clearly implicates this domain in a central way as affecting behavioral styles. The domain of environmental stress has recently become one of wide interest. Among the dimensions which might be considered are the controllability, predictability, nature, magnitude, and duration of the stressors.

That most of the domains considered influence one another is something we take as given. Nonetheless, it is important to try to determine when one domain does not influence another strongly, or when some sources of influence are more important than others. While the general model is intended to explain the various stages of drug taking and cessation, we believe that certain domains exert more influence at different stages. For instance, it appears that the influences of the intimate support system may be particularly important in the initiation of drug taking, while organismic status changes due to the drug may account more fully for continued drug ingestion. Additionally, we must ask when trait factors are more important than intimate support system factors in determining drug use, or when affective consequences of drug taking outweigh legal punishments. Therefore, we would welcome individual research groups to include measures of our various domains in order to determine the most important influences and consequences of drug use in a particular population.

In our current research program on young adolescents and their parents, we are seeking to interrelate the various domains by using structural equation models with latent variables (Bentler 1980) as well as various other hypothesis-testing procedures. These revolutionary new procedures allow the theorist to posit various linkages between the important variables of a model and then to determine, through the use of goodness-of-fit statistics on the data, whether the model is sufficient to test the formulation. In our early empirical work preliminary to detailed causal modeling, a variety of findings on adolescent drug use emerged. Perceived supply and support for drug use, important characteristics of the intimate culture, seem to be much more important determinants of drug taking than the more general characteristics of the peer culture, which are indicators of the domains of sociocultural influences (Huba et al. 1979a,b). Sources of support and supply seem to be differentiated for various drug-taking styles. In addition to rebelliousness, personality measures such as liberalism, leadership, extroversion, and the lack of deliberateness and diligence are important predictors of drug use (Wingard et al. 1979a,b). Logical introspection of the costs and benefits of drug use, as reflected in conscious decisions regarding drug use, is not strongly predictive of changes in subsequent use (Huba et al. 1979c, in press; Bentler and Speckart 1979), indicating that behavioral pressures may not be purely logical functions of "objective" pressures. Drug use seems to cluster along lines pharmacologically related to mood alteration as well as legal penalties and availability (Huba et al. 1979d). Not only are drug-related behavioral styles quite stable in young adults, but previous drug-taking behavior serves as a major predictor of future drug-taking behavior (Huba et al. 1979b; Wingard et al. 1979b), and a behavioral style involving a dangerous drug like PCP is an organized outgrowth from a history of prior substance use (Huba and Bentler 1979).

In a sample of the mothers of our adolescent sample, Wingard et al. (1979c) have shown that drug use is related to self-perceived organismic status as well as to various personality dimensions. The Wingard et al. (1979c) and Huba et al. (1979c) studies represent early applications of causal models with latent variables to drug use data.

In the future, our work will consist of integrating various results into the framework of the model shown in figure 1 as we seek to expand, elaborate, and revise the specific causal ideas pictured. It is our belief that utilizing such a sequential process allows a demonstration of ecological validity for the model by submitting it to periodic tests to establish or refute our specific claims. For example, our model proposes that the intimate support system affects drug use through perceived behavioral pressure, but not directly. Although we have demonstrated that perceived support for use is a major predictor of drug use, we have, as yet, no specific evidence on the mechanism or pathway by which the influence occurs.

A Social-Psychological Framework for Studying Drug Use

Richard Jessor, Ph.D.
Shirley Jessor, Ph.D.

The consideration of drug use in the context of a more general social-psychological framework grew out of a larger interest in exploring the utility of a social-psychological theory of problem behavior and development in youths. Formulated initially to account for deviant behavior, especially heavy alcohol use, in a triethnic community (Jessor et al. 1968), the framework was modified and extended to bear on problem behavior among youths in contemporary American society--drug use; drinking and problem drinking; sexual experience; activist protest; and general deviance, including lying, stealing, and aggression.

The most recent formulation is referred to as "problem behavior theory" (Jessor and Jessor 1977). The theory is made up of specific concepts that are organized into three explanatory systems--personality, environment, and behavior--interrelated and organized so as to generate a resultant: a dynamic state designated "problem behavior proneness" that has implications for a greater or lesser likelihood of occurrence of problem behavior. When a behavior such as drug use is embedded in such a network of concepts, the theoretical framework makes it possible to see the logical relation of drug use to other behaviors and to variations in personality and environmental characteristics as well.

This paper, prepared by Deborah Willoughby and reviewed by Richard Jessor, is based largely on three previously published sources. (1) R. Jessor and S.L. Jessor, Problem Behavior and Psychosocial Development (New York: Academic Press, 1977), pp. 17-42. (2) R. Jessor and S.L. Jessor, "Theory Testing in Longitudinal Research on Marijuana Use," in Longitudinal Research on Drug Use, ed. D.B. Kandel (Washington, D.C.: Hemisphere, 1978). (3) R. Jessor, "Marihuana: A Review of Recent Psychosocial Research," in Handbook on Drug Abuse, eds. R.L. DuPont, A. Goldstein, and J. O'Donnell (Rockville, Md.: National Institute on Drug Abuse, 1979).

The conceptual structure of problem-behavior theory consists, therefore, of the personality system, the perceived-environment system, and the behavior system. The variables in all three of the systems lie at what is essentially a social-psychological level of analysis. The concepts that constitute personality (values, expectations, beliefs, attitudes, orientations toward self and others) are cognitive and reflect social meaning and social experience. The concepts that constitute the environment (supports, influence, controls, models, expectations of others) are those that are amenable to logical coordination with the personality concepts and that represent environmental characteristics capable of being cognized or perceived; that is, they are socially organized dimensions of potential meaning for actors. Behavior, too, is treated from a social-psychological perspective, emphasizing its socially learned purposes, functions, or significance rather than its physical parameters. The actual occurrence of behavior is considered to be the logical outcome of the interaction of personality and environmental influence; in this respect, the formulation represents a social-psychological field theory, assigning causal priority neither to person nor to situation. A schematic representation of the overall social-psychological framework appears in figure 1.

STRUCTURE OF THE PERSONALITY SYSTEM

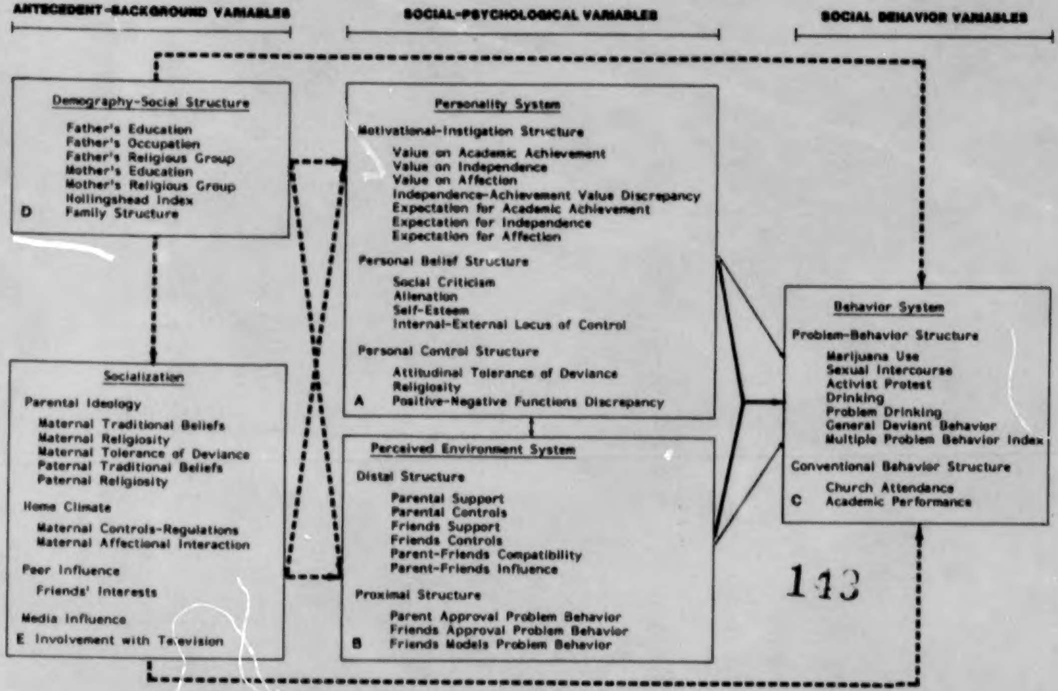
In problem-behavior theory, the personality system is represented by a number of specific variables belonging to three component structures--a motivational-instigation structure, a personal belief structure, and a personal control structure.

The theoretical concern of the variables in the motivational-instigation structure is with the directional orientation of action, that is, with the goals toward which a person strives and with the motivational sources or pressures that instigate particular behaviors. Both the value placed on goals and the expectation of attaining goals have motivational properties that influence whether behavior in the direction of those goals is likely to occur. High value on a goal, for example, the goal of achievement, implies a higher likelihood of action in that direction than does low value.

Among the variety of sociopsychological goals that animate action, three are considered central and salient for school-aged youths and relevant to problem behavior--the goals of academic achievement, independence, and peer affection. The value placed on each of these goals, and the expectation of being able to attain each of them, constitute variables in the motivational-instigation structure. An additional variable represents the relative value placed on the goals of academic achievement and independence, since the relation between these two goals appears to have especially clear and direct consequences for youthful problem behavior.

The theoretical concern of the variables in the personal belief structure is with cognitive controls of a more general nature that are exerted against the occurrence of problem behavior. The variables in this structure refer to those restraints on engaging in nonconformity that originate in a variety of beliefs about self, society, and self in relation to society. The conceptual role of such variables is to constrain against the instigations to engage in problem behavior that derive from the variables in the preceding motivational-instigation structure.

FIGURE 1.—*The conceptual structure of problem-behavior theory*


ANTECEDENT-BACKGROUND VARIABLES
SOCIAL-PSYCHOLOGICAL VARIABLES
SOCIAL BEHAVIOR VARIABLES
Demography-Social Structure
Father's Education
Father's Occupation
Father's Religious Group
Mother's Education
Mother's Religious Group
Hollingshead Index
D Family Structure
Socialization
Parental Ideology
Maternal Traditional Beliefs
Maternal Religiosity
Maternal Tolerance of Deviance
Paternal Traditional Beliefs
Paternal Religiosity
Home Climate
Maternal Controls-Regulations
Maternal Affectional Interaction
Peer Influence
Friends' Interests
Media Influence
E Involvement with Television
Personality System
Motivational-Instigation Structure
Value on Academic Achievement
Value on Independence
Value on Affection
Independence-Achievement Value Discrepancy
Expectation for Academic Achievement
Expectation for Independence
Expectation for Affection
Personal Belief Structure
Social Criticism
Alienation
Self-Esteem
Internal-External Locus of Control
Personal Control Structure
Attitudinal Tolerance of Deviance
Religiosity
A Positive-Negative Functions Discrepancy
Perceived Environment System
Distal Structure
Parental Support
Parental Controls
Friends Support
Friends Controls
Parent-Friends Compatibility
Parent-Friends Influence
Proximal Structure
Parent Approval Problem Behavior
Friends Approval Problem Behavior
B Friends Models Problem Behavior
Behavior System
Problem-Behavior Structure
Marijuana Use
Sexual Intercourse
Activist Protest
Drinking
Problem Drinking
General Deviant Behavior
Multiple Problem Behavior Index
Conventional Behavior Structure
Church Attendance
C Academic Performance

Reprinted with permission from R. Jessor and S. L. Jessor, Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth (New York: Academic Press, 1977), p.38. Copyright ©1977 by Academic Press, Inc.

Four variables are included in the personal belief structure--social criticism, alienation, self-esteem, and internal-external locus of control--and, depending on whether they are high or low, each is interpreted as controlling against engaging in problem behavior.

The theoretical concern of the variables in the personal control structure is with more specific controls against engaging in nonnormative behavior. There are three variables in the personal control structure--attitudinal tolerance of deviance, religiosity, and the discrepancy between positive and negative functions of (reasons for and against engaging in) behaviors such as drug use, premarital sexual intercourse, or drinking. These personal control variables are more directly and obviously linked to the behavior involved.

Of primary importance for the personality system as a whole is the dynamic relation between instigations and controls; their interaction yields a theoretical resultant reflecting the balance between personality-system pressure toward engaging in problem behavior and personality-system constraints against it. The main characteristics of proneness to problem behavior in the personality system include lower value on academic achievement; higher value on independence; greater value on independence relative to value on achievement; lower expectations for academic achievement; greater social criticism and alienation; lower self-esteem and an orientation toward an external locus of control; greater attitudinal tolerance of deviance; lesser religiosity; and more importance attached to the positive, relative to the negative, functions of problem behavior. The more these personality characteristics obtain for a person at a given point in time--the more that they constitute a coherent pattern, constellation, or syndrome--the more personality proneness to problem behavior they theoretically convey.

STRUCTURE OF THE PERCEIVED-ENVIRONMENT SYSTEM

The conceptual focus in the environmental system is on the environment as perceived, as it has meaning for the actor, the social-psychological rather than the physicogeographic or social structural or demographic environment. Logically, the perceived environment is the one that has the most invariant relation with behavior because it is the environment of immediate meaning and the one to which the actor is responding.

Within the perceived environment, an important distinction between "regions" is made in terms of their proximal versus distal relation to behavior. Proximal variables (for example, peer models for marijuana use) directly implicate a particular behavior, whereas distal variables (for example, the degree of normative consensus between parents and peers) are more remote in the causal chain and therefore require theoretical linkage to behavior. This distinction helps make clear why some environmental variables are likely to be more powerfully related to problem behavior than others. (The same distinction can be applied also in the personality system; the motivational-instigation variables and the personal belief variables are more distal from problem behavior, while the personal control variables are more proximal to problem behavior.)

In the distal structure of the perceived environment, the variables serve mainly to characterize whether the social context in which a youth is located is one that is more parent and family oriented than friends or peer oriented, or vice versa. Location in or orientation toward an adult or parental context is interpretable as being less problem-behavior prone than location in a peer context. In the former, there would be more involvement with conventional norms, less exposure to models for problem behavior, and greater social control over transgression.

Six variables are included in the distal structure of the perceived environment: perceived support from parents and from friends, perceived controls from parents and from friends, compatibility or consensus between parents and friends in the expectations they hold for a given adolescent, and the perceived influence on the adolescent of parents relative to that of friends.

Together, these six variables represent a patterned social environment that is more or less conducive to problem behavior, depending on whether supports and controls are perceived to be present, whether more influence comes from parents or peers, and whether there is concordance or conflict between these two reference groups, the two that have the most regulatory significance for youths. When the pattern of variables in the distal structure is such that it defines an attenuated reference orientation to parents, that is, when it suggests that a youth is located in a peer rather than a parental context, it defines greater proneness to problem behavior.

The variables included in the proximal structure of the perceived environment concern the degree to which an adolescent is located in a social context where problem behavior is prevalent and where there is social support for its occurrence. Three major variables are included in the proximal structure of the perceived environment: friends approval-disapproval for problem behavior, parental approval-disapproval of problem behavior, and friends models for problem behavior.

Of all the variables in the overall social-psychological framework, it is reasonable to expect that those in the proximal structure of the perceived environment should be among the most powerful. A context in which one's friends are perceived as engaging in problem behavior and as providing potential approval (if not pressure) for it is likely to be of direct and substantial influence. High prevalence of friends models and support constitutes not only a direct influence on problem behavior but is probably also an indirect reflection of other problem-prone factors--those that would also account for an adolescent's membership in a friendship network that has these particular characteristics rather than in one that is more conventionally oriented. It would require the perception of strong parental disapproval, or the presence of strong personality-system controls, to offset such problem-behavior proneness in the proximal structure of the perceived environment.

The primary dynamic relation within the perceived-environment system is between the perception of social controls against problem behavior, on the one hand, and the perception of models and supports for problem behavior on the other. The balance of these perceptions determines the resultant contribution of the perceived-environment system to the likelihood of problem behavior.

Problem-behavior proneness in the distal structure of the perceived environment system consists of low parental support and controls; low peer controls; low compatibility between parent and peer expectations; and low parent, relative to peer, influence. In the proximal structure, problem-behavior proneness includes low parental disapproval of problem behavior and both high friends models for and high friends approval of engaging in problem behavior.

STRUCTURE OF THE BEHAVIOR SYSTEM

The specification of behavior relies upon a variety of considerations beyond the physical parameters of the act itself--its personal meaning, its social definition, its relation to age and status, the context of its occurrence, and its time in history.

The behavior system is differentiated into a problem-behavior structure and a conventional behavior structure. Problem behavior refers to behavior socially defined either as a problem, as a source of concern, or as undesirable by the norms of conventional society or the institutions of adult authority; it is behavior that usually elicits some kind of social-control response. The latter, of course, may be as minimal as an expression of disapproval or as extreme as incarceration. The possibility that phenotypically very different behaviors (for example, smoking marijuana, engaging in sexual intercourse, or taking part in a peaceful demonstration) may all serve the same social-psychological function (for example, overt repudiation of conventional norms or expressing independence from parental control) is what underlies the notion of a structure of problem behavior. Conventional behavior, e.g., church attendance or working hard at school, is behavior that is socially approved, normatively expected, and codified and institutionalized as appropriate for adolescents and youths.

Problem behavior can function in a variety of ways. It may represent an instrumental or goal-directed effort to attain goals that seem otherwise unattainable. (The youth who is unable to secure autonomy from parental supervision may gain a sense of independence through the use of drugs.) Its purpose may be to express opposition to conventional society, whose norms and values have been rejected. It may represent an affirmation of maturity or a negotiation for transformation of status from adolescent to adult. Its meaning may lie in defining, for self and others, important attributes of personal identity (being able to hold one's liquor, being a nonvirgin). It can function also to establish solidary relations with peers, or to enable access to youth subgroups, or to permit identification with the youth subculture. Or, finally, it can serve as a way of coping with frustration and anticipated failure (drowning one's sorrows in alcohol).

The primary dynamic in the behavior system is that between the problem-behavior structure and the conventional behavior structure, with engagement in either serving as a constraint upon or an alternative to engaging in the other. High involvement in church activities or participation in academic activities should relate negatively to engagement in drug use, or problem drinking, or other problem behaviors, and vice versa. Within either the problem-behavior structure or the conventional behavior structure, there should be a positive relation among the various behaviors that are included; that is, the different problem behaviors should covary and the different conventional behaviors should covary.

PROBLEM-BEHAVIOR THEORY AND DEVELOPMENT IN ADOLESCENCE

The logical implications in problem behavior theory for development and change can be drawn by elaborating the notions of age grading, age norms, and age expectations in relation to problem behavior.

The logic of applying the same conceptual framework to development in adolescence rests on several key points: that there is stratification of society in terms of age; that access to valued roles, statuses, and rewards varies with different age strata; that adolescence, especially early adolescence, can be characterized as an age stratum of relatively limited access to certain valued goals, whether autonomy, status, sex, or mobility; that age strata have associated norms and expectations that regulate what behaviors are considered to be appropriate; and that many of the behaviors we have referred to as problem behaviors are normatively age-graded, that is, the behavior may be permitted or even prescribed for those who are older, while being proscribed for those who are younger. Drinking, as one example, is proscribed for those under legal age but is permitted and even institutionally encouraged for those who are beyond that age; sexual intercourse, normatively acceptable for adults, is a normative departure for a young adolescent, and one that is likely to elicit social controls.

Consensual awareness among youths of the age-graded norms for such behaviors carries with it, at the same time, the shared knowledge that occupancy of a more mature status is characterized by actually engaging in such behavior. Thus, engaging in certain behaviors for the *first* time can mark a transition in status from "less mature" to "more mature," from "younger" to "older," or from "adolescent" to "youth" or "adult."

Many of the important transitions that mark the course of adolescent development involve behaviors that depart from the regulatory age norms defining what is appropriate or expected behavior for that age or stage in life. It is important in this context to emphasize that *behavior that departs from regulatory norms is precisely what problem-behavior theory is meant to account for*, and this becomes the basis for the systematic application of problem-behavior theory to developmental change in adolescence. By mapping the developmental concept of *transition proneness* onto the theoretical concept of *problem-behavior proneness*, it becomes possible to use problem-behavior theory to specify the likelihood of occurrence of developmental change through engaging in age-graded, norm-departing, transition-marking behaviors.

EMPIRICAL TESTING OF PROBLEM-BEHAVIOR THEORY IN RELATION TO MARIJUANA USE

Problem-behavior theory has been employed in both cross-sectional and longitudinal studies of marijuana use, in both local and national samples, and with respect to both males and females. (See Jessor and Jessor 1977, 1978; Jessor et al., in press.) In the content of the findings, there is quite impressive coherence, whether considering the cross-sectional differences between marijuana users and nonusers, or the longitudinal predictive differences between those likely to begin use in the near future and those not. A single summarizing dimension underlying the differences between users and nonusers might be termed conventionality-unconventionality. With respect to personality, the adolescent less likely to engage in marijuana use is one who values and expects to attain academic achievement, who is not much concerned with independence, who treats society as unproblematic rather than as an object for criticism, who maintains a religious involvement and a more uncompromising attitude toward normative transgression, and who sees little attraction in problem behavior relative to its anticipated negative consequences. The adolescent more likely to be involved with marijuana shows an opposite pattern: a concern with personal autonomy, a lack of interest in the goals of conventional institutions like church and school, a jaundiced view of the larger society, and a more tolerant view of transgression.

With respect to the environment, the youth likely to be involved with marijuana perceives less parental support, less compatibility between parents' and friends' expectations, greater influence of friends relative to parents, and greater approval of and models for drug use from friends. These variables reflect the importance of whether the reference orientation of a youth is toward parents or peers, and the importance of the models and reinforcements available in the peer context. With respect to behavior, the adolescent likely to use marijuana is one who is likely to be more involved in other problem behaviors as well and less involved in conventional behavior than his or her non-drug-using counterpart.

The research findings are generally similar for both males and females, a fact worthy of emphasis. There is also similarity between high school and college youths, but it is attenuated, particularly in the personality system and in the distal structure of the perceived-environment system, suggesting that development is not homogeneous throughout the early-to-late stages of adolescence and youth. Overall, support for the utility of problem-behavior theory as a social-psychological framework for the study of drug use can be found not only in the research carried out by the Jessors and their colleagues, but in the findings from a wide variety of studies done by other investigators as well. (For a review of recent studies of marijuana use, see Jessor 1979.)

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Toward a Theory of Drug Subcultures

Bruce D. Johnson, Ph.D.

The theory of drug subcultures outlined below applies theoretical traditions developed by Sutherland (1939), Cohen (1955), Cloward and Ohlin (1960), and Wolfgang and Ferricutti (1967) to the phenomena of nonmedical drug use. Aspects of this theory are more fully explicated by Johnson (1973) and, to a lesser extent, by Johnson and Preble (1978). The concept of subculture, of course, has a long and distinguished history in anthropology and sociology (Kluckhohn 1962; Yinger 1960; Broom and Selznick 1968, p. 71), but many meanings of this concept appear to be too broad for analyzing patterns of drug use. Fine and Kleinman (1979) indicate that the subculture concept is (1) not synonymous with a subsociety or the social structure; (2) not a group of persons (primary or peer groups) or a statistical aggregate (i.e., persons aged 12 to 18); (3) not homogeneous, static, or closed; and (4) not composed only of values and central themes. Rather subcultures emerge from, are maintained by, and change over time through a complex process of interaction involving many persons and groups that may not be directly connected.

The theoretical perspective presented here is not grand theory in the manner of Parsons, Weber, or Durkheim. Rather, it more closely approximates what Merton (1957, p. 5), calls "theories of the middle range, theories intermediate to the minor working hypotheses evolved in abundance during day-to-day routines of research, and the all-inclusive speculations comprising a master conceptual scheme." Such theory "consists of general orientation toward data, suggesting types of variables which need somehow to be taken into account, rather than clear, verifiable statements of relationships between specified variables" (Merton 1957, p. 9). The perspective presented here emerges from middle-range theories in criminology and deviant behavior and focuses upon only a narrow segment of these fields--that of illicit drug use. Nevertheless, it attempts to present such general theoretical orientations toward illicit drug use by (1) building from fundamental sociological concepts (values, norms, roles, etc.), (2) describing the content of such concepts as found in illicit drug use, (3) analytically linking these concepts for purposes of theory testing, (4) including significant insights from other theories and empirical findings that have emerged, and (5) indicating unique features of this perspective that are not incorporated in others. Finally, the perspective is distinctly sociological and makes little or no attempt to incorporate psychological, biological, or pharmacological theories and insights about drug use, although overlaps with these theories are suggested at some points.

For reasons that will become clear, this perspective is most useful in understanding patterns of drug use and misuse that occur during youth and young adulthood, mainly between the ages of 11 and 25, although some persons begin earlier and some remain involved at later ages. Moreover, drug-subculture participation is related to the broad American "middle class" culture, the "peer" or youth culture, and various other subcultures. The broader framework within which drug subcultures function will be delineated first.

LINKAGES WITH THE MIDDLE CLASS, PEER CULTURES, AND OTHER SUBCULTURES

An important feature of drug subculture theory includes theoretical linkages with American "middle class culture," "peer culture," and other subcultures (Johnson 1973, pp. 6-8). The middle-class culture reflects the broad American culture and defines what adults expect youths and young adults to do or not to do. This parent culture expects youths to avoid tobacco, alcohol in excess, and nonmedical drug use. (Other norms are specified in Johnson [1973, p. 6].) The values and conduct norms of the parent culture become internalized and continue to influence youths and young adults even after departure from home.

The peer culture (also called youth culture) governs patterns of youthful behavior and friendship groups (Gans 1962; Yinger 1960). The conduct norms of the peer culture emphasize that (1) the person must be loyal to friends and attempt to maintain group association; (2) social interaction with the peer group should occur in locations where adult controls are relatively absent; (3) within such peer groups, a veiled competition exists for status and prestige among group participants and leads to new forms of behavior or operating innovations (Vaz 1967).

The concepts of peer culture and peer group are closely related. A particular person may have several close friends, the peer group. However, peer groups do not exist in isolation; several peer groups exhibit behaviors similar to other peer groups because they follow the values and conduct norms of the peer culture. Individuals generally experience the peer culture as it is mediated through a peer group.

Closely related to the peer culture and drug subcultures are other subcultures organized around different unconventional behaviors or even conventional behaviors. Each of these other subcultures has specific values and conduct norms governing the central activities around which the group functions (Cloward and Ohlin 1960) that are directly parallel to the drug subculture. Thus, delinquent subcultures emerge from those conduct norms and values which influence behaviors promoting the commission of criminal acts; homosexual subcultures emerge from values and conduct norms regulating interaction between sexual partners of the same sex; leftist or rightist subcultures follow values and conduct norms oriented toward political activity. Conventional subcultures also exist (e.g., those centered around rock or disco music, athletic participation, auto racing, etc.).

Within the peer culture and other subcultures of unconventional behavior, there is a conduct norm of veiled competition. In many middle and lower class peer groups and under a veneer of noncompetitive good fellowship and fun, "there is constant concealed competition between peer group members for leadership and status" (Vaz 1967, p. 134). Competition for status within the peer group frequently leads to experimentation with new behaviors. Such "operating innovations" if rewarded by the peer group (by increased respect or admiration for the instigator) or copied and repeated by other peer group members, and if concealed from adult authorities, frequently "generate their own morality norms, standards and rewards" (Dublin 1959). These innovations, which may not have been permitted at an earlier time, become tolerated and then accepted as normal, and perhaps demanded (a new conduct norm) of those participating in the peer group. Operating innovations within a specific peer group frequently follow a relatively predictable pattern of greater involvement in a specific subculture or experimental and/or irregular involvement in several subcultures of unconventionality. Thus, for many peer groups and for individual participants, their orientation to conduct norms and values from one or more subcultures may change over time, and their behavior may change accordingly. In addition, as the peer group learns and incorporates subcultural conduct norms, values, rituals, and argot, the members also reorient thinking toward and develop rationalizations about parental cultural values. A variety of techniques of neutralization (Sykes and Matza 1957) may be adopted to denigrate or deny the validity of parent culture conduct norms (no drugs, no sex before marriage, moderate alcohol use, etc.) and expectations for conventional behavior.

The critical fact is that the conduct norms and values from these unconventional subcultures (drug, delinquent, homosexual, etc.) are widely known within the youth or peer culture (Fine and Kleinman 1979; Jessor and Jessor 1977); individuals and specific peer groups may orient themselves to any one or a combination of values and conduct norms and behave accordingly. For example, a peer group in which each person consumes considerable amounts of alcohol, smokes marijuana, snorts cocaine, and commits burglary is simultaneously following the conduct norms and values of and participating in each of these subcultures: peer, alcohol abuse, cannabis use, multiple drug use (defined below), and delinquency. This theory suggests that peer culture participation precedes involvement in several unconventional subcultures. Thus, many statistically significant relationships between drug use and other forms of unconventional behavior (alcoholism, delinquency, criminality, multiple sex partners, etc.) may exist because of a prior involvement in the peer culture and predisposing tendencies toward unconventional behavior. Jessor and Jessor (1977), Jessor (1979), Johnston et al. (1978), and Kandel's (1978b) causal analyses of the relationship between drug use and other problem behaviors show that neither causes the other(s) and that both are the result of a preexisting tendency toward unconventional behavior.

In addition, many individuals and peer groups have also internalized values and conduct norms from the parent culture which urge avoidance

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of and/or moderation in drug use, alcohol consumption, criminal activities, and nonmarital sexual behavior. The conduct norms of the parent culture and various subcultures of unconventionality are frequently in opposition; such conflicting standards about appropriate behavior may lead individuals to shift peer group membership and experiment or moderate their unconventional behavior or drug use.

THE CONCEPT OF DRUG SUBCULTURE

Although no definition of a subculture is widely accepted at this time, an elaboration upon Wolfgang's (1967, p. 146) definition provides a good starting point; a subculture is "composed of values, conduct norms, social situations, role definitions and performances, sharing, transmission, and learning of values." The term "drug subculture" refers to those values, conduct norms, social situations, argot, rituals, role definitions, and performances that are associated with the nonmedical use of drugs. Excluded from, although related to, this concept of a drug subculture are values and conduct norms governing the medical use of drugs; the use of drugs for dieting and sleeping; the consumption of cigarettes, coffee, and tea; and the social use of alcohol. These are not socially defined as "drugs" by law, social custom, or most illicit drug users.

The most important elements of a subculture are its values and conduct norms. Values are here understood to be shared ideas about what the subgroup believes to be true or what it wants (desires) or ought to want. Probably the most important value in a drug subculture, which provides a significant discontinuity (Levi-Strauss 1953, p. 536) from the broad American conventional culture, is the intention or desire to get "high" or to experience euphoria from the nonmedical consumption of substances. This value is the organizing focus of the subcultures to be discussed hereafter.

Conduct norms are also crucial to understanding a subculture. Conduct norms are those expectations of behavior in a particular social situation that are attached to a status within the group (Wolfgang 1967). Conduct norms govern the "central activities around which the group" is organized or functions and provide "essential requirements for the performance of the dominant roles" supported by the subculture (Cloward and Ohlin 1960, p. 7). Thus, the dividing line between marginal participation and nonparticipation in a drug subculture can be rather accurately gauged by whether a person has used a particular drug in an intentional attempt to get high, although persons who express a definite wish to use the drug(s) may also be included as participants.

Roles are expectations (or norms) for appropriate behavior attached to a particular status or social position. Role performance is the person's behavior as a result of following the conduct norms while an incumbent of a particular status. Within the drug subculture(s), three roles are of central importance: seller, buyer, and user. (These roles will be elaborated later.) Performance of these roles is usually illegal and may expose the person to arrest and incarceration; thus, role performance is generally covert or hidden.

In addition to central values, conduct norms, and roles, drug subcultures frequently have specialized argot, rituals, and highly valued symbolic objects (specific drugs or instruments for administration). The heroin injection subculture (defined below) places high value upon heroin as the preferred drug and upon hypodermic instruments for injection, emphasizes drug-taking rituals, and exhibits a highly developed and specialized argot (Agar 1973; Haertzen 1979). Other drug subcultures may be less developed, but nevertheless exhibit argot, rituals, and symbolic objects that are seldom known outside the subculture, but which are widely known to those participating in the subculture.

Drug subcultures are seldom static, but change over time. While the central value (to get "high") and central roles (seller, buyer, user) remain relatively unaltered over time, the conduct norms may shift considerably in response to social pressure from the middle-class culture and pressure from the legal system, fads in drug preferences, and availability of drugs in the illicit market. Moreover, innovation and change are highly valued in most drug subcultures. New drugs are sought out and tried, argot terms are easily adopted and old terms dropped, and the times and places for drug consumption may change. Of course, individual participants, groups, and demographic segments of the population involved in a given set of subcultural activities may change greatly during a period of years. Arnold (1970, p. 114) indicates "while subcultures grow out of the interaction of groups of people, they are not themselves those groups" or persons. Moreover, subcultures are maintained by the continuing interactions of persons. Because these interactions tend to be dynamic, subcultures are also dynamic and continuously self-modifying.

Subcultural differentiation is common and changes over time. Since a subculture refers to role relationships, values, conduct norms, rituals, and argot, subcultural boundaries are always fluid and imprecise. An attempt to delineate the central conduct norms and values may simplify the number of subcultures to be described and analyzed. For instance, the multiple-drug subculture (described below) may include sub-subcultures focused around psychedelic drugs (LSD, peyote), pills, or cocaine, which may be useful for other analytical purposes to other sociologists. Any boundaries selected for defining a subculture are somewhat arbitrary and may not be more correct than other definitions or boundaries. Most boundaries should be considered to have heuristic value when and if they assist theoretical and empirical research to understand how drug use and abuse is structured and functions within the subculture, and how it relates to nondrug subcultures and to the broader culture.

Subcultural participants may observe an elaborate and differentiated role structure, set of conduct norms, and argot. For example, one respondent objected strenuously to a questionnaire that included his favorite drug (mescaline) among the psychedelics; he had an elaborate set of reasons why mescaline's effects and patterns of use were very different from those of LSD. Subcultural participants tend to ignore great similarities in behavior and response to the same conduct norms by other users and to emphasize the importance of what seem (to outsiders) to be small differences in argot, ritual, appearance, and some behaviors. Hence, subculture definitions and boundaries can seldom be agreed upon, either by sociological analysts or by participants, although the central values, conduct norms, roles, and behaviors may provide a useful analytic framework.

The sociohistorical origins of a particular drug subculture appear to be a product of drug use beginning among peer groups having certain sociodemographic characteristics and the spread of information via youth mobility, and informal communication channels among youths (Fine and Kleinman 1979). Mass media coverage of a particular drug has frequently created strong public reaction (Brecher 1972) leading to attempts at control or elimination of nonmedical use that has later been associated with negative consequences (Lindesmith 1965). The social history and rise of any one particular drug subculture in America are beyond the scope of this overview, but excellent reviews exist (Musto 1973; Lindesmith 1965; Brecher 1972; King 1972; Helmer and Vietoriez 1974; National Commission on Marihuana and Drug Abuse 1973). Two particularly critical historical events affect subculture formation: (1) the adoption of a drug by many peer groups within a small segment of the population--as with heroin and morphine among working-class whites in the 1920s (Street 1953; Musto 1973) and urban blacks in the 1950s and 1960s (Helmer and Vietoriez 1974; Preble and Casey 1969) and (2) the expansion of use of a drug(s) into peer groups more representative of the general youth population as occurred with marijuana, LSD, cocaine, and other substances in the late 1960s and 1970s (Carey 1968; Johnston et al. 1978). When patterns of drug use are limited to low-income and low-status groups, societal reaction tends to be punitive, and government pursues a prohibitionist policy. When drug use becomes common in many segments of the youth population, public reaction is one of temporary alarm with later adjustment (Becker 1967, 1974) and easing of enforcement effects and legal punishments (Johnson and Uppal, in press).

When the drug-subculture theory was presented by Johnson (1973), two different drug subcultures were identified. Both subcultures began with marijuana use, but participants in the white drug subculture used hallucinogens and pills, while black subcultural participants disproportionately used cocaine and heroin. The use of all drugs has expanded greatly since 1971, however, and four varieties or sub-subcultures within the broader drug subculture may be distinguished: (1) the alcohol-abuse subculture, (2) the cannabis subculture, (3) the multiple-drug-use subculture, and (4) the heroin-injection subculture. These four subcultures are strongly related to each other (Kandel 1975, 1978b), generally in a unidimensional and cumulative fashion (Single et al. 1974). Among American youths in the early 1970s, experimentation with and increasingly regular use of alcohol preceded marijuana use, which in turn preceded the consumption of other substances (hallucinogens, sedatives, stimulants, and cocaine), all of which preceded heroin consumption (except, perhaps, in a few inner city ghetto communities where some youths may have begun heroin directly [O'Donnell and Clayton 1979]). Drug-subculture theory provides a conceptual framework for analyzing why and how youths become differentially involved in substance use.

Each of these drug subculture varieties or sub-subcultures has numerous and different conduct norms associated with it. Each subculture emphasizes particular conduct norms (see examples below) that govern the central activities of the group and of individual adherents or participants. Moreover, norms shift over time for an individual and a peer group. General types of conduct norms will be identified and then related to each of the four subcultures mentioned above: (1) experimentation conduct norms--the subcultural participant is expected to consume the focal drug or drugs; (2) maintenance conduct norms--the participant is expected to enjoy the behavior, to repeat the requisite behavior, and to increase the frequency and amount used to the level common in the group; (3) reciprocity conduct norms--when in peer groups, participants are expected to provide others with a portion of their drugs either for free or at low cost, but the obligation is reciprocal for future occasions; (4) distribution conduct norms--the participant is expected to buy the relevant substance, to understand the informal and illegal distribution system, and to engage in drug selling on a systematic basis.

These general classes of conduct norms are somewhat different in the four identified drug subcultures that are briefly described here.

THE ALCOHOL ABUSE SUBCULTURE

Alcohol is a powerful psychoactive substance that is widely and legally available in America. (The same can be said for tobacco, coffee, and tea.) Moreover, alcohol is widely used in the conventional middle-class culture as a beverage and as an agent for promoting social interaction and relaxation. Experimentation with alcohol is the rule rather than the exception. The alcohol-abuse subculture, however, has maintenance norms that stress the use of alcohol to "get high," "smashed," "ripped," and to promote inebriating consumption. Reciprocity conduct norms include the pooling of money to buy alcohol, the obligation to buy drinks for others at some time in the immediate future, and bottle passing in drinking groups. Distribution norms include purchasing liquor when younger than the legal drinking age, or selling it to the under-age drinker. For the most part, however, this subculture's conduct norms governing distribution are not well developed because alcohol can be easily and legally obtained; during prohibition, however, illicit distribution conduct norms quickly developed.

THE CANNABIS SUBCULTURE

Marijuana has become increasingly institutionalized in America in the past decade (Akers 1977; Jessor 1979; Johnson and Uppal, in press). Experimental or maintenance conduct norms require the use of marijuana, generally by smoking. Informal pressure from one's peer group or best friends has consistently emerged as a major factor in marijuana experimentation (Kandel 1978b) and in the routine and heavy use of marijuana or hashish. After initiating use, the participants are expected to use it on a routine basis, frequently on a weekly or daily basis; as the regularity of use increases, the amount consumed per occasion may also increase. The cannabis subculture promotes the sharing of marijuana and hashish. A joint is frequently shared by many at a party, or where a peer group congregates. Usually, no money is involved in such sharing but different group members are expected to provide the drug at various times. Distribution norms expect weekly or more frequent users to buy their own supply and/or to share with others. Often the buyer of a relatively large amount (an ounce or more) is expected to give away or sell smaller amounts to friends at cost (Carey 1968). Persons who become regular dealers of cannabis are expected to give free samples, socialize, and smoke with potential buyers. Of course, marijuana may also be sold as a strictly commercial product, albeit illegal, among unacquainted persons.

THE MULTIPLE-DRUG SUBCULTURE

This subculture grows out of the cannabis subculture and is distinguished by the use of many substances in addition to cannabis (Single et al. 1974). The experimental conduct norms expect the participant to try almost any substance to achieve euphoria. Substances such as hallucinogens, barbiturates, other sedatives, stimulants, tranquilizers, inhalants, PCP, cocaine, and, possibly, heroin may also be tried. Even unknown substances may be tried. Maintenance norms expect the participant to use small amounts of different substances by sniffing, smoking, or oral consumption; injection by hypodermic needle is usually avoided. While the regularity of use of a particular drug may be irregular (less than weekly), several different substances may be consumed within a particular week or on a single day. Sharing conduct norms are important; a person having a supply of pills or cocaine is expected to share this supply with friends, who may reciprocate on another day with the same or different drugs. The distribution conduct norms expect participants to combine funds, work jointly to obtain drugs, locate supplies, and use whatever drugs are available within their price range. From the selling side, substances such as heroin and cocaine have relatively high economic value and are seldom distributed freely; dealers are not expected to provide free samples or socialize as much as with cannabis selling. Persons selling other substances frequently sell marijuana as well.

THE HEROIN-INJECTION SUBCULTURE

This subculture, frequently referred to as the addict subculture, expects participants to consume heroin via hypodermic injections. Maintenance conduct norms expect injections on a weekly, daily, or more frequent basis. While heroin is occasionally shared with peers, obligations to reciprocate at a later time or provide some other service ("cop" drugs) are strong. Many participants are expected to sell drugs or heroin or supply "connections" to other subcultural participants (Lindesmith 1947, 1965; Preble and Casey 1969; Agar 1973; Stephens and Levine 1971; Stephens and McBride 1976; Stephens and Smith 1976; Smith and Stephens 1976; Johnson and Preble 1978).

The drug subculture perspective holds that participation in the alcohol-abuse subculture predisposes one toward participation in the cannabis subculture (Kandel 1976, 1978b), which is almost a precondition--among American youths--for participation in the multiple-drug-use subculture; many heroin-injection subculture participants have been previously, and continue to be, involved in the multiple-drug-use subculture.

Drug-subculture theory is designed to explain group behavior. Individual behavior is defined as a function of following the subculture's values, conduct norms, roles, rituals, and argot. The greater a person's commitment to a drug-using group and to subcultural values, conduct norms, roles, rituals, and argot, the greater the predictability of behavior of that individual. While the following sections occasionally refer to an individual, such a person is considered to be an abstract actor who typifies the pattern of initiation to drugs and increasing participation according to the conduct norms, roles, rituals, and argot of the specific drug subculture. Because there are many different levels of participation in any subculture, and because a given individual holds a variety of roles in many spheres of society and may be exposed to conflicting norms that may limit subcultural commitment, the

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vast majority of specific individuals using drugs may not become increasingly and successively involved in each of the drug subcultures.

USE, ABUSE, DEPENDENCY, AND ADDICTION

Drug-subculture theory does not employ the concepts of abuse, dependency, and addiction. These concepts are primarily seen as labels (Becker 1963; Rubington and Weinberg 1973) applied to subcultural roles or participants by social-control agents and persons not involved with drug use, although terms such as "junkie," "freak," "pothead," and "dope fiend" are frequently used as self-identities by subcultural participants. Subculture theory maintains that terms and concepts used to describe patterns of drug use will shift over time both within the various subcultures and outside them. Subculture theory holds that participants tend to define their behavior as "normal" and to project such patterns upon others regardless of how statistically rare their behavior may be. Thus, drug consumption episodes that social-control authorities consider abusive are considered normal and are expected of subcultural participants, especially those in dealer roles. Moreover, as time passes and levels of use increase in many segments of the population, the parent culture and legal institutions begin--reluctantly--to accept subcultural definitions. For example, marijuana use on a weekly basis was frequently labeled as heavy use in surveys conducted during the early 1970s, while near-daily use is now being considered as heavy use (Johnston et al. 1978; Jessor 1979; Johnson and Uppal, in press). Even with regard to self-labeled "addicts," research shows patterns of irregular use, lengthy periods of cessation, followed by relapse to daily use. Thus, various commentators (Robins 1976; Zinberg 1979; Johnson 1978; Johnson et al. 1979) have indicated doubt about what constitutes opiate addiction or dependency.

UTILITY AND LIMITATIONS OF THE DRUG SUBCULTURE PERSPECTIVE

The strengths of the drug-subculture perspective include the following: (a) It is formulated in terms of norms, values, roles, role behavior, rituals, and argot affecting interaction between peers regarding the intentional nonmedical use of drugs. Building from fundamental sociological concepts, the researcher's effort can be directed toward describing, linking, and analyzing the relationships of these concepts. (b) It provides a broad conceptualization which can incorporate findings and empirical regularities from other studies. (c) It emphasizes the importance and centrality of the pattern of illegal drug distribution to patterns of drug use, to initiation of other substances, and to other social problem behaviors (alcoholism, criminality, etc.). (d) It addresses the phenomena of drug abuse at a group level and focuses upon those aspects (values, conduct norms, rituals, and argot) that cannot be explained as the sum of individual behavior, psychological states, or physiological reactions to drug consumption. (e) It provides a means of explaining or understanding change in drug use by individuals, groups, and within the subculture itself. Few other perspectives (to the author's knowledge) present a conceptual model for explaining behaviors associated with the illegal drug market and linking them to drug use. (See Langer 1977; Goode 1970.)

The drug-subculture theory presented by Johnson (1973) has received little commentary or criticism in the professional literature. Most of the empirical relationships presented there have been uncovered in other studies, but testing of the theoretical aspects has been widely neglected. Nevertheless, some limitations have been informally commented upon and await further research in the near future.

This perspective is difficult to prove since the critical independent variables, the conduct norms, cannot be measured directly. That is, expectations of behavior in a particular situation were not and cannot be measured directly, although Orcutt (1978), Akers et al. (1979), and Short and Strodtbeck (1965) have made attempts to measure such normative orientations. Johnson (1973) only makes inferences about the conduct norms from the behavior (cannabis, hallucinogen, heroin, or other drug use) which is to be explained. This is a critical problem that is unlikely to be rectified in the future. Another weakness is the current lack of specification about why, how, and where subcultures emerge and change through time. There is a distinct need for ethnographic studies of drug-using peer groups to observe, question, and analyze the conscious awareness of expected behavior and unconscious motivations--hypothesized to be due to the conduct norms--directing individual and group patterns of drug use. Survey research can document the effects, but a more careful elaboration of the process is needed.

The evidence presented in Johnson (1973) is based upon a cross-sectional survey in which longitudinal data are needed to test many of the critical processes hypothesized. This shortcoming was noted in the book; some recent longitudinal studies have presented findings supporting some hypothesized processes (Single et al. 1974; Single and Kandel 1978; Kandel 1978b; Johnston et al. 1978; Jessor and Jessor 1977), but not others (Ginsberg and Greenley 1978).

Jessor (1979) indicates discomfort with the drug-subculture perspective because (a) large proportions of the youth populations (frequently more than a majority) now use marijuana, making it difficult to distinguish clear subcultural boundaries, and (b) the role of peers in initiating nonusers to marijuana use and drug-related role behaviors appears no different from the role of peers in influencing other behavioral domains--values, sexual behavior, styles of dress--in which peer influence is considerable. Jessor's comments appear to equate the concept of subculture with a subsociety (see Fine and Kleinman 1979), while the subculture perspective outlined here does not do so. In addition, the mechanism (peer influence) by which persons are recruited for participation in any of the various nonconventional subcultures (see above) may be similar, but the conduct norms, values, rituals, argot, and "central activities around which the group" is organized (Cloward and Ohlin 1960) may reflect differentially structured and conceptually distinct subcultures.

A major problem with applying subculture theory to drug use is dissatisfaction with the diffuse and widespread meanings the term "subculture" has acquired. The absence of an accepted definition for this concept, a feature shared with many other sociological concepts and theories, however, should not detract from the potential of drug-subculture theory. Such a theory can alert the researcher and reader to critical concepts and distinctions, measurable behavior patterns, potentially fruitful hypotheses or relationships between variables, and lead them to important insights about how and why drug users behave the way they do.

Developmental Stages in Adolescent Drug Involvement

Denise B. Kandel, Ph.D.

INTRODUCTION

A variety of human characteristics pertaining to cognitive, psychological, and physiological functions have been shown to follow well-defined developmental sequences. Some of the best known of the developmental stage theories include Piaget's (1954) hierarchical theory of cognitive structures and Kohlberg's (1973) related theory of moral behavior. The appearance of different stages has been postulated to result either from biological maturation that is under genetic control or from the interaction of the biological organism with the environment--physical, social, or cultural.

I would like to propose that culturally determined developmental stages can be observed with respect to drug behavior. However, I advance this notion not as a formal, grand theory of drug use, but rather as a framework around which to develop specific theories of initiation, progression, and regression in drug behavior.

Substances that are subject to abuse include not only the illegal drugs, but those such as alcohol and tobacco that are commonly used in society for recreational purposes, as well as the medically prescribed psychoactive drugs, such as stimulants and minor tranquilizers. Until fairly recently, considerations of patterns of sequential or multiple drug use were restricted to a consideration of the illegal drugs. Retrospective studies of the drug histories of heroin addicts, in which marijuana use was found to characterize every respondent, gave rise to the controversial "stepping stone" theory of drug addiction in which use of marijuana was assumed inevitably to lead to the use of hard drugs, especially heroin. The theory is problematic (Goode 1972, 1974), and with rare exceptions (see O'Donnell and Clayton 1978), few investigators today accept it.

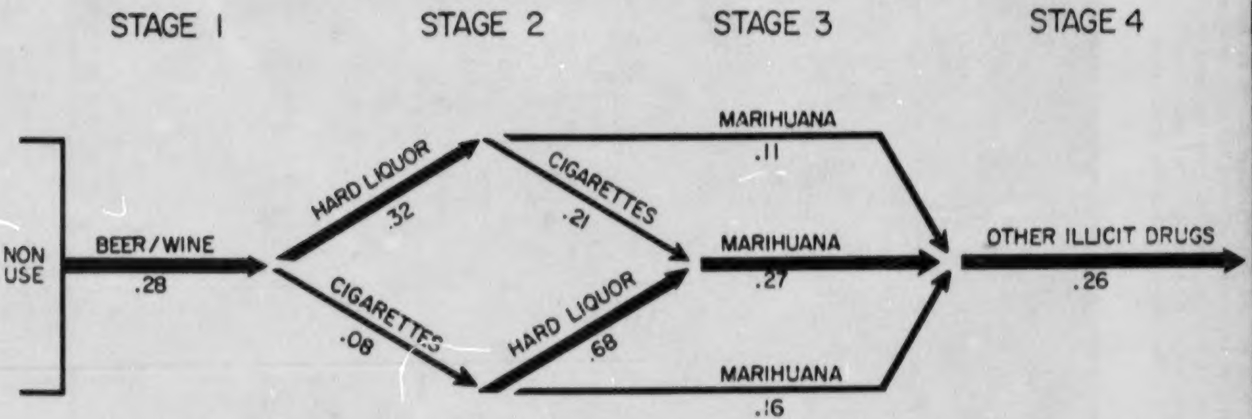
However, studies of drug-use patterns in different cohorts of adolescents suggest that there are at this time in the United States well-defined stages and sequences in patterns of drug involvement and that the so-called legal drugs, such as alcohol and tobacco, must be accepted as an integral and crucial part of the sequence. It is most important to keep in mind that position on a particular point in the sequence does not indicate that the individual will necessarily progress to other drugs higher up in the sequence. Rather, we suggest that the use of a drug lower in a sequence is a necessary but not a sufficient condition for progression to a higher stage indicating involvement with more serious drugs.

This developmental notion of stages in drug use is empirically derived from extensive analyses of cross sectional and longitudinal data on patterns of drug use in adolescence. At least four distinct developmental stages in adolescent involvement in legal and illegal drugs can be identified: (1) beer or wine, (2) cigarettes or hard liquor, (3) marijuana, and (4) other illicit drugs. The supporting evidence for this model is twofold: (a) results of analyses of hierarchical and sequential patterns of drug use, and (b) results of longitudinal analyses where different variables identify adolescents at risk who progress from one stage to the next.

SCALOGRAM ANALYSES OF PATTERNS OF DRUG USE

The first suggestion of stages in drug use came from scalogram analyses carried out on a cross section of New York State adolescents (N=8,206) in public secondary schools (Single et al. 1974). Guttman scale analysis is especially well suited for analyzing the ordering of patterns of drug use because of its properties of unidimensionality and cumulation. Since the scale items all measure the same underlying dimension, the scale ranking of respondents indicates not only how many but which drugs they have used. Therefore, knowing an individual's score on a given scale, one can estimate which substances have been used, though not the order in which they have been used. The results indicated that adolescent drug use behavior fit a valid Guttman scale. The patterns of lifetime use of drugs could be arranged according to a well-defined cumulative and one-dimensional hierarchical order with seven steps. The fit of the data with the Guttman scale model implied that youths at any one step have used the drug at that particular level as well as all drugs ranked lower, but they have not used any of the drugs ranked higher. Since these earlier findings were based on data gathered at one time, no time order among the usage patterns could be established. Direct evidence was provided by Guttman scale analyses of drug use responses over time (Kandel 1975; Kandel and Faust 1975). Analyses were replicated on two different cohorts: (a) a representative panel sample of high school students in New York State followed over one school year at a five- to six-month interval (N=5,468); and (b) a panel sample of seniors who were contacted five to nine months following graduation from high school (N=985). At least four distinct developmental stages in adolescent involvement in legal and illegal drugs were identified. These were noted above: (1) beer or wine, (2) cigarettes or hard liquor, (3) marijuana, and (4) other illicit drugs. (See figure 1.) The legal drugs are necessary intermediates between nonuse and marijuana. For example, whereas 27 percent of the high school students who had smoked and had drunk hard liquor progressed to marijuana within the five-month followup period, only two percent of those who had not used any legal substance did so. Marijuana, in turn, was a crucial step on the way to other

FIGURE 1.—***Major stages of adolescent involvement in drug use***


STAGE 1
STAGE 2
STAGE 3
STAGE 4
NON USE
BEER/WINE
.28
HARD LIQUOR
.32
CIGARETTES
.08
CIGARETTES
.21
HARD LIQUOR
.68
MARIHUANA
.11
MARIHUANA
.27
MARIHUANA
.16
OTHER ILLICIT DRUGS
.26

Major changes of adolescent involvement in drug use. Probabilities of moving from one stage to another based on changes between Fall 1971 and Spring 1972 in a cohort of New York State high school students, 14 to 18 years old. Youths who started using more than one drug within the followup interval were distributed in a sequential order which reproduced the proportions of known exclusive starters of each drug.

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illicit drugs. While 26 percent of marijuana users progressed to LSD, amphetamines, or heroin, only one percent of nonusers of any drug and four percent of legal users did so.[1] This sequence was found in each of the four years in high school and in the year following graduation. The same steps were followed in regression as in progression in patterns of use within the followup interval.

Except for our own research, no other studies that specifically test the notion of stages that we have advanced have yet appeared in the literature. Related analyses include scalogram analyses and analyses of self-reported order of first usage. We carried out additional scalogram analyses on sets of data besides the New York State sample to test further the applicability of the stage model to other samples of youths. We have found the same sequential pattern among males and females and among adolescents of different ages. Variations in scalability are observed in black as compared to white adolescents (Single et al. 1974; Jessop et al. 1976; Jessop et al. 1977), although the same overall model fits the data in both racial groups.

Prior to our studies, only two scalogram analyses had been reported in the literature, both inadequate because of methodological or conceptual limitations. Sinnitt et al. (1972) concluded that drug experiences of college students with alcohol and illicit substances were unidimensional and cumulative. However, the sample of 33 cases was very small and selected. Loiselle and Whitehead (1971), on the other hand, concluded that drug use patterns did not fulfill the criteria for unidimensionality implied by Guttman scaling. However, questionable decisions in the study must be noted, namely the restriction of the analysis to users of illicit drugs. Out of a sample of 1,606 high school students, the authors focused on 257 users of any of five drugs (marijuana, stimulants, tranquilizers, glue, and barbiturates) in one analysis (or 16 percent of the sample), and on 105 marijuana smokers (or seven percent) in another. The skewed marginal distribution of the illicit drug use items is not sufficient methodological justification for restricting the analyses to users, since techniques are available to correct for such skewness. Furthermore, the exclusion of nonusers of illicit drugs eliminated a crucial part of the sample required to consider patterns of nonuse and use of various drugs. Indeed, tobacco and alcohol were excluded, although these substances are crucial to a consideration of processes of drug use.

By relying on a different criterion for defining usage order, namely self-reported order of first use, Whitehead and Cabral (1975-76) subsequently reached a conclusion different from that based on the earlier Guttman scaling. Mean order of first use of 10 drugs, including tobacco and alcohol, in a sample of 902 adolescent users was tobacco, alcohol, marijuana, and other illicit drugs, in that sequence. A similar order has been reported by Goldstein and his collaborators (Goldstein et al. 1975) among college students from an analysis of self-reported time of initial use of each of eight drugs. A matrix of pairwise comparisons among the drugs was created according to the order of first use for each drug in a pair. Beer and liquor appeared to precede tobacco, followed by marijuana and by other illicit drugs.

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[1] It must be kept in mind that these probabilities of change typify the particular cohorts that were studied and would probably be somewhat different in different samples contacted at a different period.

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However, the order of tobacco and liquor was somewhat ambiguous: Among those students who had used both drugs, the same proportion reported having used each first. Intentions for future use followed the hierarchical pattern of use with "the more unusual drugs . . . most often . . . desired only after acquaintance with the more common substances" (p. 26). From the longitudinal data available in their study, the authors presented only the proportion of each class of users who progressed or regressed along the assumed hierarchy of drugs over the four years of college, with no specification of the particular drugs used.

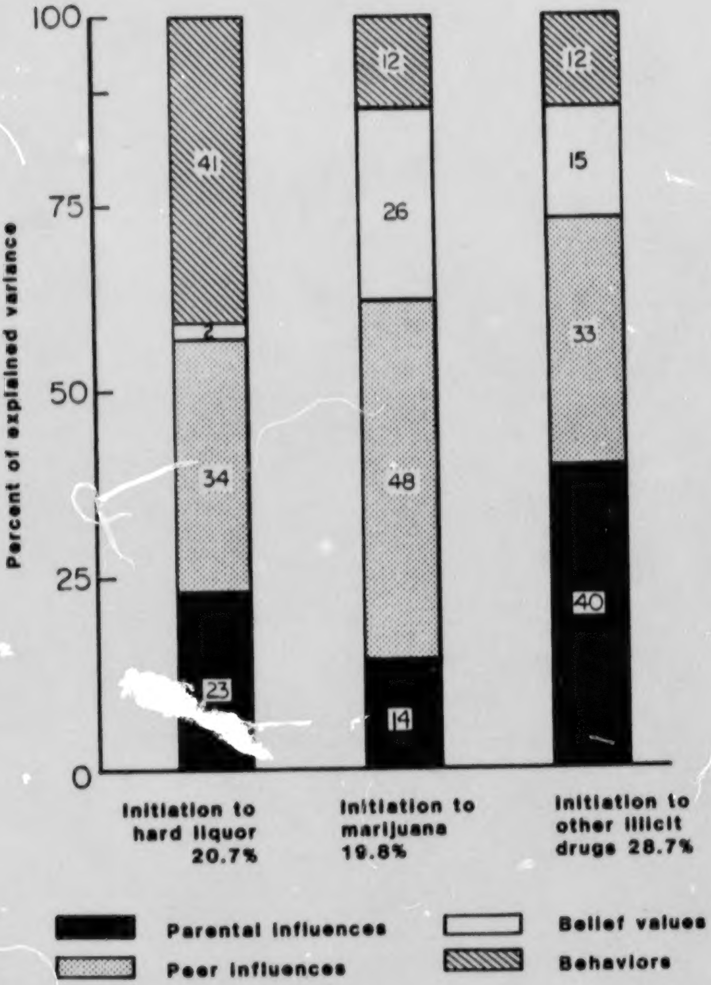
As we noted earlier, longitudinal data are required for a definite test of developmental stages in drug behavior. In the absence of other contradictory evidence, the longitudinal analyses of patterns of drug behavior over time that we have conducted and the inferential data provided by other investigators constitute to date strong evidence for the existence of stages in drug use.

STAGE-SPECIFIC PREDICTORS OF DRUG INITIATION

Further evidence for the existence of stages is provided by the findings that different social psychological factors predict adolescent initiation into different stages of drug use. We have combined the notion that adolescent drug use involves sequential stages with a longitudinal research design in which the population at risk for initiation into each of the stages could be clearly identified. This has allowed us to assess the relative importance of various factors to predict initial transitions into various types of drug behaviors. The social-psychological antecedents of entry into three sequential stages of adolescent drug use--hard liquor, marijuana, and other illicit drugs--were examined in a two-wave panel sample of New York State public secondary students and subsamples of matched adolescent-parent and adolescent-best-schoolfriend dyads (Kandel et al. 1978). Each of four clusters of predictor variables--parental influences, peer influences, adolescent involvement in various behaviors, and adolescent beliefs and values--and single predictors within each cluster assume differential importance for each stage of drug behavior. (See figure 2.) Prior involvements in a variety of activities, such as minor delinquency and use of cigarettes, beer, and wine, are most important for predicting hard liquor use. Adolescents' beliefs and values favorable to the use of marijuana and association with marijuana-using peers are the strongest predictors of initiation into marijuana. Poor relations with parents, feelings of depression, and exposure to drug-using peers are most important for predicting initiation into illicit drugs other than marijuana.

Thus, at the earliest levels of involvement, adolescents who have engaged in a number of minor delinquent or deviant activities, who enjoy high levels of sociability with their peers, and who are exposed to peers and parents who drink start to drink themselves. The relationship with parental use of hard liquor suggests that these youths learn drinking patterns from their parents. The use of marijuana is preceded by acceptance of a cluster of beliefs and values that are favorable to marijuana use and in opposition to many standards upheld by adults, by involvement in a peer environment in which marijuana is used, and by participation in the same minor forms of deviant behavior

FIGURE 2.—*Percentage of explained variance accounted for by each successive cluster*



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that precede the use of hard liquor. By comparison use of illicit drugs other than marijuana is preceded by poor relationships with parents, by exposure to parents and to peers who themselves use a variety of legal, medical, and illegal drugs, by psychological distress, and by a series of personal characteristics somewhat more deviant than those that characterize the novice marijuana or hard liquor user.

CONCLUSION

At this time in history in the United States, adolescents' involvement in drugs appears to follow certain paths. Beer and wine are the first substances used by youth. Tobacco and hard liquor are used next. The use of marijuana rarely takes place without prior use of liquor or tobacco, or both. Similarly, the use of illicit drugs other than marijuana rarely takes place in the absence of prior experimentation with marijuana.

The documentation that different factors are important for different drugs provides additional support for the claim, developed on the basis of Guttman scale analysis, that drug involvement proceeds through discrete stages. The notion of "stage" itself allows a more fruitful specification of the role and structure of different causal factors at different stages of involvement.

For example, as regards interpersonal influences, we find at different stages not only differences in source of influence but also differences in the aspects of interpersonal influences that are important. In the early stage of drug use, parental behavior seems to be critical in leading the youth to experiment with hard liquor. In later phases of initiation, the quality of the parent-child relationship becomes important, with closeness to parents shielding adolescents from involvement in the most serious forms of drug use. Similarly, there is evidence that a generalized peer influence, which is important in predicting initiation to legal drugs and marijuana, is partially supplanted by the influence of a single best friend in leading to the initiation of other illicit drugs. Findings of this kind point to the importance of examining profiles of interpersonal influences over a series of behaviors, values, and attitudes in order to understand better their dynamic nature. Thus, if one accepts the notion that progressively more serious involvement in drugs underlies the stages we have outlined, the data suggest that the more serious the behavior, the greater the relative importance of the specific role model provided by one friend in contrast to the same behavior of the whole group.

Similar specification occurs with respect to the role of participation in deviant behaviors. Participation in various deviant behaviors is most relevant in starting to use alcohol, least for illicit drugs. The less serious the drug, the more its use or nonuse may depend on situational factors. By contrast, initiation into illicit drugs other than marijuana appears to be a conscious response to intrapsychic pressures of some sort or other.

Many theories of drug dependence offer some concept of individual pathology as a primary explanation, while others stress social factors. Each of these concepts may apply to different stages of the process of involvement in drug behavior, social factors playing a more important role in the early stages; psychological factors, in the later ones.

The identification of cumulative stages in drug behavior has important conceptual and methodological implications for identifying the factors that relate to drug use, either as causes or as consequences. In a longitudinal analytical framework, there should be decomposition of the panel sample into appropriate subsamples of individuals at a particular stage who are at risk for initiation into the next stage. Since each stage represents a cumulative pattern of use and contains fewer adolescents than the preceding stage in the sequence, comparisons of users and nonusers must be made among members of the restricted group that has already used the drugs at the preceding stage. Otherwise, the attributes identified as apparent characteristics of a particular class of drug users may actually reflect characteristics important for involvement in drugs at the preceding stage(s). The definition of stages allows one to define a population at risk and to isolate systematically, within that population, those individuals who succumb to this risk within a specific time interval.

The notion of stage itself is somewhat ambiguous (Wohlwill 1973). Among developmental psychologists, controversy exists about whether the notion of stages implies that development must necessarily occur in a hierarchical and fixed order, as Piaget, for example, proposes. However, the notion of invariance must be subjected to empirical test (Phillips and Kelly 1975). This is especially important for drug behavior. Indeed, as regards the notion of stages in drug use, two reservations must be kept in mind. To date, the stages have been identified in populations of American adolescents. The specific sequences are probably culturally and historically determined. Crosscultural studies are required in order to determine the extent to which the order that has been observed is in fact an invariant one. These studies would indicate whether or not involvement in illicit drugs is always preceded by use of legal drugs, as appears to be the case in the United States, or whether, in certain cultures, involvement in cigarettes, alcohol, and marijuana proceeds along parallel and nonoverlapping paths. Furthermore, while the data show a very clear-cut sequence in the use of various drugs, they do not prove that the use of a particular drug infallibly leads to the use of other drugs higher up in the sequence. Many youths stop at a particular stage without progressing any further. Nor can the findings be interpreted to show that there is something inherent in the pharmacological properties of the drugs themselves that leads inexorably from one to another.

The stage theory itself is a recent conceptualization of drug behavior and needs further testing and documentation.

Self-Esteem and Self-Derogation Theory of Drug Abuse

Howard B. Kaplan, Ph.D.

THEORY OVERVIEW

Within the context of the general theory of deviant behavior presented below, opiate dependence as well as use/abuse of other illicit substances (hallucinogens, barbiturates, amphetamines, marijuana, alcohol) is regarded as an alternative deviant response to self-rejecting attitudes generated in the course of normative membership-group experiences which function more or less effectively to reduce the experiences of the subjectively distressful self-rejecting attitudes. As a theory of deviant behavior it would apply only to drug use/abuse patterns which do not conform to the normative expectations of the person's (predeviance) membership group(s) and which derive from the loss of a previous motivation to conform or from the development of a new motivation to deviate from normative expectations. The definition excludes behaviors which, although defined as deviant by other groups, are compatible with the normative expectations of the subject's membership/reference groups, as well as behaviors to which the person was motivated to conform but was incapable of so doing because of conflicting expectations or physical incapacity. The theory, thus, would not be applicable in situations where, for example, marijuana use was nearly universally observed and/or approved (as on a college campus relatively isolated from extracollege influences) or where the behavior was highly compatible with other values whether or not it was an already established pattern (as where experimentation with illicit drugs in a slum youth social network is congruent with the valued attributes of toughness and adventuresomeness). Normative socialization or social learning theories would be more appropriate to the explanation of illicit drug use/abuse in these situations.

The theory considers the common factors more or less directly influencing the adoption of any of a range of deviant patterns, the factors influencing the adoption of one rather than other deviant patterns (e.g., opiate versus hallucinogen use, drug use versus interpersonal violence, property crimes), and factors influencing the continuity of the deviant pattern.

The theoretical model is based upon the postulate of the self-esteem motive, whereby, universally and characteristically, a person is said to behave so as to maximize the experience of positive self-attitudes, and to minimize the experience of negative ones. Self-attitudes refer to the person's (more or less intense) positive and negative emotional experiences upon perceiving and evaluating his or her own attitubutes and behavior. The model does not apply in the rare instances in which a basic condition for the development of the self-esteem motive is not present. This condition is the early and continued existence of stable relationships between self and significant others in the context of which the behavior of significant others is predictably contingent upon the responses of self. Such a condition is not present where the responses of significant others are either uniform (whether in a punitive or rewarding direction) or random.

Intense self-rejecting attitudes are said to be the end result of a history of membership group experiences in which the subject was unable to defend against, adapt to, or cope with circumstances having self-devaluing implications (that is, disvalued attributes and behaviors, and negative evaluations of the subject by valued others). These encompass a range of variables apparent in other theories including peer rejection, parental neglect, high expectations for achievement, school failure, physical stigmata, social stigmata (e.g., disvalued group memberships), impaired sex-role identity, ego deficiencies, low coping abilities, and (generally) coping mechanisms that are socially disvalued and/or are otherwise self-defeating. The likelihood of experiencing circumstances with self-devaluing implications and/or failing to possess effective adaptive/coping/defensive patterns (which would forestall or assuage the experience of circumstances with self-devaluing implications) is in turn influenced by complex patterns of interacting social (value system, available social support mechanisms, complexity of the social system, rate of social change, positions in the social system, etc.) and ontogenetic (including constitutionally given deficits) variables.

By virtue of the actual and subjective association between past membership group experiences and the development of intensely distressful negative self-attitudes, the person loses motivation to conform to, and becomes motivated to deviate from, membership group patterns (those specifically associated with the genesis of negative self-attitudes and, by a process of generalization, other aspects of the membership groups' normative structures). Simultaneously, the unfulfilled self-esteem motive prompts the subject to seek alternative (that is, deviant) response patterns which offer hope of reducing the experience of negative (and increasing the experiences of positive) self-attitudes. Thus, the person is motivated to seek and adopt deviant response patterns not only because of a loss of motivation to conform to the normative structure (which has an earlier association with the genesis of negative self-attitudes) but also because the deviant patterns represent the only motivationally acceptable alternatives that might serve self-enhancing functions effectively.

Which of several deviant patterns is adopted, then, would be a function of the person's history of experiences influencing the visibility and subjective evaluation of the self-enhancing/self-devaluing potential of the pattern(s) in question. A particular drug use/abuse pattern is more likely to be adopted, for example, if, due to the greater availability of the drug its use was more apparent among peers at school or in the neighborhood--that is, if the pattern was more visible. The subjective likelihood of self-enhancing consequences of the behavior will reflect such variables as the subjectively perceived attitudes toward the illicit drug abuse pattern by members of positive and negative reference groups (peers, family, authority figures, school), the visibility of more or less prevalent adverse consequences of use of the illicit drug (arrest, loss of control, etc.), and the perceived compatibility of the consequences and concomitants of the drug abuse pattern with behavior (in)appropriate to (dis)valued social roles.

Adoption of the deviant response has self-enhancing consequences if it facilitates intrapsychic or interpersonal avoidance of self-devaluing experiences associated with the predeviance membership group, serves to attack (symbolically or otherwise) the perceived basis of the person's self-rejecting attitudes (that is, representations of the normative group structure), and/or offers substitute patterns with self-enhancing potential for behavior patterns associated with the genesis of self-rejecting attitudes. Avoidance functions might be served through the consequent rejection of the subject who adopted the drug abuse pattern by the normative membership groups in which the self-rejecting attitudes were developed (resulting in decreased vulnerability to continuing self-devaluing experiences), facilitating regressive return to a more dependent state (thus avoiding one's responsibilities and the risk of failure to carry them out), the pharmacologic effects of detachment or anesthetization of self-punitive feelings, etc. Attacks upon the normative structure are symbolized by the illicit nature of the behavior pattern. Substitute gratifications may be provided by identification with a community of users who accept the subject by virtue of his or her conformity to group norms, pharmacologic induction of feeling in control of one's moods, facilitation of self-enhancing social interaction, replication of an earlier time (the womb) of feeling more accepted, etc.

To the extent that the person in fact experiences self-enhancing consequences, is able to defend against any intervening adverse consequences of the behavior (anticipated or unanticipated), and does not perceive alternative responses with self-enhancing potential the pattern is likely to be confirmed. Whether or not these outcomes occur will be a function of such mutually influencing variables as the nature of the deviant act, societal response to the act, and the person's need-value and adaptive/coping patterns. For example, a highly visible and highly disvalued act might lead to apprehension and adjudication with consequences of stigmatization, enforced deviant role enactment, exacerbation of a need to justify the act through continued performance of it, isolation from social control, isolation of the subject from legitimate opportunities, and exposure to self-enhancing illegitimate patterns, while at the same time being congruent with personal need disposition (e.g., power) and defense/coping mechanisms (e.g., attack). In such a case the deviant pattern might become part of the subject's personal and (new) social lifestyle, with the pattern being performed as appropriate to the new lifestyle and with gratification coming from conformance with the lifestyle. Insofar as the new lifestyle precludes the experience of self-devaluing life events which were characteristic of former membership group experiences, the deviant pattern should, a fortiori, have self-enhancing consequences.

Or, the deviant pattern may have a low probability of evoking severe (if any) sanctions from membership groups (whether because of low visibility or otherwise) but still have self-enhancing consequences, in which case the subject may be expected to perform the pattern in response to discrete life events with self-devaluing implications. The frequency of the deviant pattern becomes a function of the frequency of self-devaluing life events and continuity of a net aggregate of gratifying over punishing consequences of the deviant adaptation.

However, cessation of the drug abuse (or other deviant patterns) would be likely to occur if and when self-devaluing outcomes outweighed self-enhancing outcomes. In that case the subject would be likely to experiment with alternative modes of deviance, since normative patterns would continue to be motivationally unacceptable as long as they were subjectively and in fact associated with self-devaluing experiences. But insofar as individual maturation and correlated changes in socio-environmental experiences (including social support systems) reduce the likelihood of self-devaluing experiences, offer new opportunities for self-enhancement, and provide the person with effective coping mechanisms and a correlated realistic sense of control over the environment, the illicit drug use is likely to cease in favor of normative response patterns.

The person is likely to relapse into the deviant response pattern only in the face of erosion of personal and social support mechanisms, pervasive self-devaluing experiences, and a history of self-enhancing consequences of earlier illicit drug use.

Support for the theory is provided by a consideration of the compatibility of the theory with previous studies on deviant behavior (Kaplan 1972, 1975b) and by the results of a prospective longitudinal study of adolescents which was designed to test several aspects of this theory, including those concerning the postulate of the self-esteem motive (Kaplan 1975d), hypothesized antecedents of negative self-attitudes (Kaplan 1976a), relationships between antecedent level of (and increases in) self-derogation and subsequent adoption of deviant responses (Kaplan 1975a, 1976b, 1977b, 1978a), factors said to intervene between self-derogation and subsequent deviant response patterns (Kaplan 1975c, 1977a), and self-enhancing consequences of deviant responses (1978b).

SPECIAL POPULATIONS

The theory applies specifically to populations in which any particular drug use/abuse pattern under consideration is regarded as deviant. It does not apply to populations in which the pattern is uniformly adopted and/or approved.

The Iowa Theory of Substance Abuse Among Hyperactive Adolescents

Jan Loney, Ph.D.

STATEMENT OF THEORY

Childhood hyperactivity is believed to affect approximately five percent of elementary school children and to represent perhaps 50 percent of children referred for evaluation to child psychiatrists and psychologists. It is a complex condition, variously defined, and its cause and cure are unknown. Although described by several overlapping terms, some of which presume a subtle organic etiology (e.g., minimal brain dysfunction or MBD), diagnostic emphasis has centered upon the four As: activity (hyperkinetic reaction of childhood), attention (attention deficit disorder), aggression (conduct disorder), and/or achievement (learning disability).

Hyperactive children are generally considered to be at significant risk for the development of low self-esteem, academic skill deficits, and a variety of delinquent behaviors--including substance abuse. A body of data connects childhood hyperactivity with subsequent antisocial and alcoholic diagnoses (e.g., Goodwin et al. 1975). That connection has been shown to be familial (Cantwell 1972; Morrison and Stewart 1971) and is considered by some to be genetically determined. Many experts on hyperactivity endorse what is often called the primary-secondary theory (Cantwell 1978; Wender 1971). According to that theory, hyperactivity and a variety of closely related symptoms, such as inattention, are primary or constitutional features of the hyperkinetic child's condition. In medical terms, these primary symptoms are assumed to covary across time and situations, and they constitute the core hyperkinetic syndrome or attention deficit disorder. Secondary or resultant symptoms, such as aggression, are assumed to be the product of negative interactions between the hyperkinetic child and his or her environment: punitive parenting, academic failure, peer rejection, etc. Thus, antisocial and norm-violating behaviors such as substance abuse are viewed as secondary consequents of severe primary hyperkinesis. Another popular theory might be called the conduct disorder theory (Barkley, in press; Quay 1979). Proponents of that theory stress the inseparability of hyperactivity and aggression, and they maintain that hyperactive children (i.e., children with conduct disorders) are noncompliant, destructive, explosive, aggressive, and antisocial at all ages. Adolescent substance abuse would thus be viewed merely as an age-appropriate expression of the hyperactive individual's lifelong conduct disorder.

The theory of drug use developed at Iowa is derived from ongoing multivariate and multisituational studies of several hundred hyperactive boys (Loney et al., in press *a*; Loney et al., in press *b*). Youngsters in these studies were referred for outpatient psychiatric evaluation between four and 12 years of age. All were diagnosed as having the hyperkinetic syndrome or minimal brain dysfunction. Each was then treated either pharmacologically (with a central nervous system stimulant) or psychologically (with behaviorally oriented parent and teacher consultation). They are being followed up as adolescents (at 12 to 18 years of age) and as young adults (at 21 to 23 years of age).

Hyperactive children are often lost to school-based questionnaire studies because of reading disabilities, truancy, early school dropout, and placement in special education classes. Data from a presumably vulnerable clinic population such as ours are therefore well suited for answering some initial questions about the attitudinal and behavioral precursors of experimentation with substances early in the substance abuse sequence (Kandel 1975). We have used multivariate statistical techniques to identify those variables from the referral and early treatment periods which predict variation in adolescent behavior and to estimate their relative importance in accounting for that variation.

The results of our studies to date suggest that hyperactivity and aggression are essentially independent (Loney et al. 1978). Childhood hyperactivity is neither a precursor of adolescent aggressive and self-destructive behavior in general, nor a predictor of teenage substance abuse in particular. In our data, the anticipated link between early hyperactivity and later delinquency is missing. Although adolescent aggression *is* apparently exacerbated by negative environmental events, it does *not* appear to be a secondary result of primary or core hyperactivity. Instead, the link is between early aggression and later delinquency; thus, childhood aggression is apparently primary (Werry 1979). Hyperactive children are *not* at risk for later illegal substance use unless they are also aggressive; aggressive children are at risk for later illegal substance use whether they are hyperactive or not.

Thus, the outcome for any particular group of children considered to have hyperkinetic reactions, attention deficit disorders, specific learning disabilities, or minimal brain dysfunction syndromes will depend on what proportion of the group is also aggressive. And that proportion will depend in turn on such factors as: (1) whether children with aggressive temperament and behavior (e.g., irritability, defiance, fighting, cruelty) or with diagnoses of conduct disorder or unsocialized aggressive reaction are included in the group because their aggressive behaviors and diagnoses are considered to be inseparable from or developmental expressions of their hyperactive syndrome; (2) whether selection criteria favor the inclusion of youngsters who are both hyperactive and aggressive (e.g., by including children who live in foster and group homes) or hinder their inclusion (e.g., by excluding children from chaotic, punitive, and disadvantaged backgrounds); and (3) whether the circumstances of the study lead, de facto, to an increased probability that children will be sampled who are aggressive as well as hyperactive (e.g., studies done in public or tertiary facilities as opposed to private-practice settings).

Diagnostic, selectional, and situational factors that explicitly or implicitly facilitate the inclusion of aggressive children in a so-called "hyperactive" sample will also facilitate the conclusion that hyperactive children tend to abuse drugs. Factors biased against the inclusion of aggressive children will have the opposite effect. To reduce the danger of such discrepant and confusing effects, we have suggested that children who are hyperactive and aggressive be diagnostically and prognostically separated from children who are exclusively hyperactive (Langhorne and Loney 1979).

Among the other predictors of behavioral outcomes among so-called hyperkinetic children are the social or environmental correlates of aggression: social class, family composition, parenting style, urban residence, etc. While individual aggressive characteristics, such as rebelliousness, determine a youngster's susceptibility to illegal drug use, many of these socioecological antecedents of aggression also influence the availability of illegal substances. It is our feeling that the interaction of susceptibility and availability explains why exclusively hyperactive (nonaggressive) youngsters do not abuse drugs. Although they may be susceptible to drug use because of their immaturity and restlessness, many are also socially awkward and rejected children to whom drugs are less available because of their isolation from the peer settings in which much early drug use is initiated (Jessor and Jessor 1977).

In our theory, childhood aggression and childhood hyperactivity are assumed to have different antecedents and different consequents both at referral and at followup. If valid, this theory also explains why treatment with central nervous system stimulants does not lead to improved adolescent behavior and reduced delinquency (Weiss et al. 1975). Although drug treatment reduces childhood inattention and hyperactivity, behavior outcome and subsequent delinquency are determined instead by childhood aggression and by its ecological antecedents--which are not affected by drug treatment. Thus, drug treatment for childhood hyperactivity is ineffective in reducing adolescent symptomatology because childhood hyperactivity is not the first link in a chain leading to teenage delinquency and deviant behavior (Milich and Loney 1979).

A complete theory of substance abuse will ultimately describe the multivariate interaction of enduring personal factors or traits, such as aggression (Eron 1978; Olweus 1978; Robins 1978), with situational factors, such as parental modeling, peer pressure, substance availability, and treatment history. A good theory will encompass and estimate the effects of such individual factors as age, sex, and race; such geographical factors as region and community; and such temporal factors as year or era--all of which have been little studied among hyperkinetic children. In so doing, an adequate theory will locate drug attitudes and use within a matrix of health-threatening and norm-violating behaviors.

In addition to the likelihood that stimulant medication fails to decrease the risk of delinquency in general among hyperkinetic children, concern has been expressed about the possibility that treatment with stimulant drugs further increases the risk that hyperkinetic children will abuse drugs--either pharmacologically (by initiating a dependency that children continue on their own) or psychologically (by creating a predisposition toward chemical solutions for complex problems). Because ethical and practical considerations preclude random assignment of children to long-term treatment groups, investigators interested in the safety and efficacy of treatment with stimulants have usually had to rely on naturally occurring diagnostic and treatment groups. Therefore, the great majority of early followup studies (e.g., Laufer 1971; Mendelson et al. 1971; Minde et al. 1971; Weiss et al. 1971) were carried out on samples of previously medicated youngsters, without control groups or systematic comparison data. There are some recent data (Beck et al. 1975; Denhoff and Stern 1979; Henker et al., in press) comparing substance use among previously medicated hyperactive children and nonhyperactive (and, of course, nonmedicated) agemates. Although few group differences were found in these data, it is unclear to what degree a negative effect of hyperactivity (or of behavior problems in general) might have been canceled out by a positive effect of medication. Or perhaps a positive effect associated with hyperactivity was canceled out by a negative effect of medication. Hechtman et al. (in press) found no greater substance abuse among essentially untreated hyperactive youngsters and their nonhyperactive classmates. Blouin et al. (1978) compared treated and untreated youngsters within a hyperactive sample and found no statistically significant ($\underline{p} < .05$) differences between the groups in their use of hard liquor, beer, wine, or marijuana.

Another design has involved the comparison of hyperactive and nonhyperactive individuals within larger groups of psychoeducational, psychiatric, or neurological referrals. Two such studies (Blouin et al. 1978; Schuckit et al. 1978) have yielded numerically intriguing but statistically insignificant differences in substance use associated with hyperactivity--even though aggressive youngsters were not specifically excluded. Likewise, two studies of hyperkinetic children (Cantwell 1972; Morrison and Stewart 1971) that are widely cited as supporting the link between hyperactivity and subsequent alcohol use and antisocial behavior are difficult to interpret because childhood hyperactivity and childhood aggression are not separated. More of Goodwin et al.'s (1975) alcoholic adoptees recalled being hyperactive as children than did nonalcoholic controls, but they also recalled being more aggressive and shyer. Among an adolescent group being treated for drug abuse, Schuckit et al. (1978) found that hyperkinetic/antisocial subjects were significantly more likely than nonhyperkinetic subjects to have been warned by a physician that drugs had damaged their health. That finding is difficult to interpret, however, because more of the hyperkinetic subjects probably had contact with physicians, who may be prone to attribute symptoms among hyperkinetic youngsters to drug abuse (Topaz 1971) when in fact the symptoms predated the use of illegal drugs.

Among drug-treated hyperactive children, good treatment response appears to be associated with less use of alcohol (Blouin et al. 1978) and of drugs (Kramer and Loney 1978) at five-year followup. Much further work is obviously going to be required, particularly to separate and specify the effects on adolescent drug use of: (1) behavior and learning problems in general (by comparing hyperactive children with randomly selected or normal children); (2) hyperkinesis per se (by comparing hyperkinetic children with other children having behavior and learning problems); (3) the diagnosis or label "hyperkinetic" (by comparing diagnosed hyperkinetic children with undiagnosed hyperkinetic children); (4) drug treatment for hyperkinesis (by comparing medicated hyperkinetic children with nonmedicated hyperkinetic children); and (5) pharmacological response to that treatment (by comparing medicated hyperkinetic children who responded well with medicated hyperkinetic children who did not). Meanwhile, it appears that the risk of substance use among hyperactive youngsters may be neither great nor increased by early drug treatment.

SPECIAL POPULATIONS

Although our theory is derived from examination of an "abnormal" sample, it can be removed from a medical context by considering hyperactivity and aggression as psychological traits rather than as psychiatric disorders. There is, in fact, considerable doubt that childhood hyperactivity is an authentic medical syndrome (Langhorne et al. 1976; Ross and Ross 1976; Sandberg et al. 1978). A medical syndrome should ideally have a specific etiology, a particular pattern of symptoms, a predictable response to treatment, and a uniform course and outcome. Certainly hyperactive children are noted for their interindividual heterogeneity and their cross-situational variability, and questions of etiology and diagnosis remain unanswered. In psychological terms, then, individual susceptibility to subsequent drug use is associated with childhood aggression. It is not associated with childhood hyperactivity, either directly or indirectly (through the effect of hyperactivity on aggression). Such translation from psychiatric categorization to psychological quantification places these findings regarding the predictors of substance use among hyperactive children into a comparable framework as studies of predictors of substance use among children in general (Jones 1968; Lettieri 1975). However, one genuinely special population consists of children who have been treated with stimulant drugs. Within that population, two special subpopulations are those children whose clinical response has been positive (i.e., who have shown symptom reduction) and those children whose clinical response has not been positive. So far, it is not clear that drug treatment per se modifies children's attitudes in such a way that the probability of subsequent drug use is affected either positively or negatively. But our theory, and the findings from which it is derived, suggest that positive drug response may reduce the probability of subsequent drug abuse by decreasing children's irritability, touchiness, and sullenness, and by increasing their frustration tolerance. If so, this would be an effect of medication upon the early temperamental/emotional aspects of aggressive behavior. Medication does not appear to have direct effects on any overtly behavioral aspects of aggression except for substance use.

Reinforcement and the Combination of Effects

Summary of a Theory of Opiate Addiction

William E. McAuliffe, Ph.D.
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The theory summarized here emerged from systematic empirical research and critical reexamination of prior literature concerning opiate addiction (McAuliffe and Gordon 1974, 1975, 1979; McAuliffe 1975a,b, 1979; Gordon 1979). This effort has resulted in the firm establishment of euphoric effects as one of the several major sources of reinforcement deriving directly from opiates even in chronic addiction (McAuliffe and Gordon 1974, 1975), and clarification of the conditions under which euphoric effects are available even to many first-time users of opiates (McAuliffe 1975a). Prior to these investigations, most social scientists accorded a relatively restricted role to euphoria (e.g., Lindesmith 1947), and this view also found considerable acceptance among physical and medical scientists. Euphoric effects sometimes reported or assumed in the medical literatures were often considered atypical. Now, with such fundamental issues behind us, it is possible to use a reinforcement theory to organize and interpret many of the more detailed empirical phenomena of opiate abuse, where that theory has available to it for explanatory purposes the full range of effects produced by opiate drugs. The present digest reflects the current stage of development of such a theory. (For a full statement, see McAuliffe and Gordon 1979.)

A BRIEF OVERVIEW

THE CAUSE OF ADDICTION

According to our theory, opiate addiction is caused by the extremely potent reinforcing effects of opiate drugs. These effects consist of euphoria (including the impact effect or "rush"), reduction of withdrawal, and miscellaneous psychotherapeutic and analgesic properties, which combine independently to produce a complex schedule of reinforcement for taking opiates. Opiate use, consequently, is an operantly conditioned response whose tendency becomes stronger as a function of the quality, number, and size of the reinforcements that follow it. *Addiction*, in our theory, refers to the strength of the drug-taking response and is thus a continuous variable, rather than a qualitatively different state. Addiction begins to grow with the first reinforced opiate-taking response. When the opiate-taking response has become powerful enough, as the result of sufficient reinforcement, the user experiences an increased desire or "craving" for opiate effects.

Craving may, however, be contingent upon the presence of discriminative stimuli that signal to the user that reinforcement for taking opiates is indeed possible; for example, that he or she is not under opiate blocking by antagonists such as naloxone at the time. An experiment by Mirin et al. (1976, figure 3) found that addicts' self-reported intensity of craving rose rapidly when heroin was readily available, fell rapidly under methadone detoxification, and remained low when heroin was again made available while the subjects were on a blocking regimen receiving naltrexone.

A more meaningful definition of "addiction." In common parlance, persons are said to be "addicted" when they have become physically dependent or at least seem unable to refrain from using a drug. We regard these events as merely signalling that a sufficient history of reinforcement has probably been acquired to impel a high rate of use. In the case of strong physical dependence, the user is confronted with the necessity of responding at a minimal rate (which happens to be also a high rate) if immediate use for whatever reason is to continue at all and if a negative reinforcer is to be successfully avoided. In our theory, there is no single point at which an individual suddenly becomes "addicted." Instead, the individual's addiction develops insidiously and varies continuously, so that what others seemingly mean when they label someone an "addict" is merely a person with a strong addiction (i.e., a history of reinforced drug taking sufficient to outweigh the more acceptable reinforcers of life, such as are associated with one's job, family, friends, sex life, and respectability).

Physical dependence on opiates is neither a necessary nor a sufficient condition for the development of addiction. Physical dependence simply sets the stage for experiencing withdrawal distress, reduction of which constitutes one of the drug's powerful reinforcing effects. Other effects (principally euphoria, but including secondary social gains, and relief of pain, anxiety, and fatigue) can themselves produce or contribute to addiction. Most, if not all, street addicts are reinforced in the early stages of heroin use by effects other than withdrawal, and their drug-taking response at that stage must be strong enough so that it occurs every day for a few weeks in order for them to develop physical dependence. Since contemporary opiate abusers know about physical dependence and usually prefer to avoid it, their daily use prior to dependence must reflect the existence of an addiction of some strength. We have interviewed heroin users who had never been dependent but who were either adamant about wanting to continue heroin use despite the risks and severe social pressures or convinced that they could not stop even though they wanted to. We and other researchers (Lindesmith 1947; Robins 1974a) have also interviewed persons who had used opiates compulsively on a daily basis for many months without ever interrupting long enough to experience withdrawal sickness.

The distinction between addiction and physical dependence is also evident in detoxified addicts who are temporarily free of dependence but who are still strongly addicted, as witnessed by their expressed desire for opiates and their disposition to relapse, and in those medical patients who become physiologically dependent without knowing it but who remain indifferent because they have not developed a strong psychological attachment to opiates. (See Lindesmith 1947 for examples.)

Our theory implies that singling out any particular point in a reinforcement history as the stage of "addiction" is more or less arbitrary. We recognize, however, that there are advantages associated with employing physical dependence as a tacit operational criterion of "addiction." Because the withdrawal syndrome (1) is a salient phenomenon that usually implies a substantial history of prior reinforcement, (2) introduces a potent new reinforcer, and (3) sets a new lower bound on the rate of continued use, the point at which physical dependence appears serves as a useful peg on which to hang a definition of "addict" that signals important changes in lifestyle. This highly visible point divides opiate users into those with and without such major lifestyle changes with great efficiency (i.e., low false-positive and false-negative rates). Indeed some addicts date their being "hooked" from the time they recognized major changes in their lifestyle, such as intense craving, getting fired from their job, or realizing that they preferred heroin to sex (Hendler and Stephens 1977, p. 41).

Convenient though it may be, there are important disadvantages associated with equating addiction with physical dependence as laymen do, or with making physical dependence a necessary but not sufficient condition of addiction in a theory of opiate use (Lindesmith 1947). By encouraging the notion that physical dependence is necessary in order for addiction to be present, one also encourages the seriously misleading impression--according to our theory--that a user is relatively safe as long as physical dependence is avoided. This conception opens neophytes to the insidious features of onset underscored by the reinforcement perspective, according to which predependence use is more dangerous than seems apparent because the actual onset accrues gradually with each reinforcement.

Clearer recognition of withdrawal sickness as but another potent source of reinforcement should dispel some of the controversy over whether "addiction" is defined as a physical phenomenon or as a psychological phenomenon and thus also clarify the related issue of whether drugs that do not entail physical dependency are "addicting." The distinction between the two conditions is certainly a valuable one, since one adds a potent reinforcer that the other lacks, but the decision to regard one or the other state as addiction proper is, from our theoretical standpoint, basically arbitrary, and hence the theoretical discontinuity between the opiate and nonopiate types of chronic drug use no longer obtains.

The role of psychopharmacological factors. While we grant that an individual's personality, expectations, and the setting in which an opiate is used play important roles in the addiction process, we hold that opiates themselves have intrinsic properties that cause them to be powerful reinforcers and therefore potently addictive. Experimental research with animals demonstrates that personality variables, peer pressure, poverty, or other social environmental factors are not essential for the self-administration of opiates (Schuster and Thompson 1969). Moreover, a review (McAuliffe 1975a, pp. 374, 382) of relevant research showed that normal human subjects in double-blind experiments under markedly unfavorable conditions were willing to repeat the experience caused by their initial doses of opiate drugs, and that reactions to the drug effects became increasingly favorable with repeated administration. Thus, in many normal subjects there is sufficient neutrality or favorableness to permit repetition of the initial dose, and favorableness tends to snowball in the course of early repetition. Finally, evidence from studies by Robins and her associates (Robins and Murphy 1967; Robins et al. 1974a) suggests that the probability of addiction in the case of heroin is considerably greater than that associated with other illicit drugs. Although surveys (e.g., O'Donnell et al. 1976) show that heroin is the illicit drug least often tried by users, they also show that the percentage of users who become strongly addicted and in need of treatment is greater for heroin than for any of the other major drugs of abuse (Siegel 1973, p. 1259; O'Donnell et al. 1976, pp. 67, 79, 126).

The role of individual differences. Individual differences do, however, play an important part in the addiction process. Animal studies (Deneau 1969; Davis and Nichols 1962) have found that even test animals vary substantially in their conditionability to opiates, and researchers have bred rats (Nichols and Hsiao 1967) and mice (Eriksson and Kiianmaa 1971) to produce marked differences in the animals' willingness to self-administer opiates. Furthermore, humans also vary in the effects opiates have on them and in the particular effects they seek from opiates, and these variations appear to have profound effects on subsequent drug-related behavior. Heroin addicts, strongly oriented toward euphoric effects, use large amounts of the drug and even commit crimes to pay for drugs, whereas physician addicts and iatrogenic addicts, who typically are not interested in attaining euphoria, usually moderate their doses and rarely turn to crime to finance their drug consumption. These relationships have led one of us to propose that there are two distinct forms of opiate addiction: One has euphoria seeking as a focus, and the other does not (McAuliffe 1979).

CONCLUSION

It is important to stress that operant reinforcement theory is merely the starting point for our theory of opiate addiction, which attempts to specify the connections between and to convey the relative importance of the various psychopharmacological and social variables that bring about initiation, continuation, and termination of illicit use of opiates. Our theory differs most from other theories that are based mainly or entirely on the avoidance of withdrawal as their source of reinforcement (e.g., Akers 1977; Lindesmith 1947, 1975; Wikler 1965, 1973b) because of the major role it reserves for positive reinforcement from euphoria, and because it considers the overall balance of reinforcement from both the social environment and drugs in motivating abstinence. Those who continue to question the importance of euphoria (e.g., Akers 1977, p. 101) in addiction because it is not always present on every shot have yet to confront the difference in criminality between euphoria-seeking addicts and other addicts as a factor in determining social importance. Although barbiturates also cause physical dependence and severe withdrawal symptoms, and although they were also freely available in Southeast Asia, serious morbidity from drug use among U.S. Army enlisted men was confined to the chronic use of heroin, and habituation to barbiturates was infrequent (Siegel 1973, p. 1259; Robins 1974b, pp. 26, 34). Clearly, there must be more involved in opiate addiction than physical dependence. Although there is also an extensive psychiatric literature that emphasizes self-medicating use of opiates to alter moods as a coping mechanism rather than euphoria (e.g., Duncan 1977; Khantzian et al. 1974; Powell 1973; Sheppard et al. 1972; Weech 1966), euphoria is often mentioned spontaneously in their case histories but not elaborated in their explanations (e.g., Khantzian et al. 1974). Pleasurable experiences of themselves, moreover, have psychotherapeutic value, so that self-medication need not exclude euphoria even when self-medication does motivate drug use.

As we see it, the more distinguishing features of our theory are its emphasis on the intrinsic reinforcement properties of opiates, especially euphoria; the theory's conception of addiction as a continuous variable and an insidious process; its attention to and identification of the relevant contingencies and schedules of reinforcement peculiar to opiates and actually governing the behavior of human addicts at various stages of their careers; and its flexibility in being able to distinguish and accommodate the existence of several different types of addict (weekenders, hardcore addicts, euphoria seekers, and medical addicts). No mere translation of operant conditioning theory could accomplish these various ends.

Addiction to an Experience

A Social-Psychological-Pharmacological Theory of Addiction

Stanton Peele, Ph.D.

OVERVIEW

A theory of addiction must be able to explain the following phenomena: (1) the range of substances which are able to fulfill all the criteria for addictiveness, (2) the variability in the addictiveness of different drugs (a) in different cultures and (b) for different individuals in the same culture, (3) the impact that groups and other social factors have on both the addictive use of a drug and withdrawal from it, and (4) variations in the individual life cycle which influence the individual's likelihood of being addicted. A theory that accomplishes this will need to take into account all the levels of variables that play a role in human functioning, including biological variables, personality, physical and social environment, and cultural and political variables. The key concepts for enabling us to conceptualize all of these variables and their interactions are the *experience* that an individual derives from a drug and the way in which this experience fits into the entirety of his or her life.

A drug's chemical structure does not predict the addictive effect the drug will have on an individual. Hence the impossibility of defining addiction pharmacologically, as a property of a drug (Jaffe 1970a). We have now seen that not all people become addicted to narcotics, even when these drugs are administered regularly and in heavy dosages. On the other hand, people form addictions to a range of nonnarcotic substances--from barbiturates, synthetic narcotics, and alcohol to nicotine, caffeine, and sedatives. The addictive response begins with the characteristic effect of a drug and is modified by the individual's reaction to that substance as well as his or her general outlook. In addition, setting, groups, and cultural attitudes influence the experience the user has with the drug and his or her need for that experience.

THE ANALGESIC EXPERIENCE

Pharmacologists have long sought to develop a drug that reproduces the analgesic effects of the narcotics without being addictive. This pursuit of the "nonaddictive analgesic" is based on the misunderstanding that only a specific molecular structure interacts with the nervous system to produce addiction (Peele 1977). Starting with heroin, which was developed to replace morphine, the search for a nonaddictive analgesic has uncovered a host of new addictive substances, including the barbiturates, the synthetic narcotics such as Demerol and methadone, and the nonbarbiturate sedatives (Kales et al. 1974).

What is evident from this research is that any drug which serves an analgesic function can be used addictively. It is, in fact, the experience of having pain relieved to which the individual becomes addicted. This can be described through reference to the addiction cycle. Persons who are faced with persistent difficulties and anxieties in their lives and who are not prepared to cope with them realistically resort to analgesic drugs for comfort. While enabling them to forget their problems and stress, the pain-killing experience engendered by the drugs actually decreases the ability to cope. This is because such drugs depress the central nervous system and the individual's responsive capability. Along with this, people do not focus on their problems while intoxicated with a drug, and so the sources of the stress that led them to take the drug are likely to worsen as a result of having been ignored.

Not everyone responds to the analgesic experience in the same way. Some people find a narcosis tremendously alluring, while others report that the sensations of helplessness are disturbing and distinctly unappealing. Persons who welcome this experience do not feel able to come to grips with their problems. They are thus susceptible to the temporary protective cloak provided by the drug and are not concerned for that time with the reduction in coping capacity that they suffer.

It is important to note that the objective stress that a person faces and his or her reaction to the situation are not the same thing. Settings with which some people cope readily may be overwhelming to others. Even people in apparently favorable surroundings may find them intolerable. Self-efficacy and self-esteem are crucial ingredients in the person's makeup that explain these discrepancies. Self-esteem and guilt are also essential to the addiction cycle. Part of the drive to seek the analgesic effect of a drug comes from the drug's suppression of the anxiety a person feels; being intoxicated by this experience, however, exacerbates the person's guilt and disrespect for himself or herself, which are strong parts of the motivation to seek intoxication in the first place.

Withdrawal appears in the addiction cycle when the cycle progresses to the point where the analgesic experience is the major and, indeed, sole source of gratification for a person. All other rewards are mediated by the effects of the drug. To remove the drug from a person's system is to remove a necessary means of functioning and, beyond this, the desire to endure the demands his or her system now confronts. Adverse withdrawal symptoms begin with the fact that all drugs having a measurable impact on the human organism will also produce a reverse effect when removed, since the body must now compensate for the action of the drug on which it has depended. How the individual reacts to this disorientation--and, in particular, how severe the disorientation is--depends on the same factors which determined the initial reaction to the drug.

Let us consider why hospital patients receiving regular dosages of a narcotic at higher-than-street-level concentrations rarely report noting a withdrawal response when they return home and cease their use of the drug (Zinberg 1974a). As long as individuals feel they can deal with their lives, do not think of themselves as addicts, and reenter an environment which does not acknowledge withdrawal and provides strong alternate gratifications, they will not experience debilitating withdrawal. In the case of the hospital patient, we see that a setting may temporarily produce a level of discomfort which is comparable to that which the addicted drug user experiences regularly. Like the addicted user, the patient may rely on drugs in the hospital. When the patient leaves the hospital and the discomfort behind, however, and reengages in meaningful activities, the drug experience loses its usefulness.

The field research which illuminates most clearly the role of setting in addiction is that surrounding the Vietnam soldier. In Vietnam, facing stress, discomfort, danger, lack of social support, and the absence of opportunities for constructive effort, many men resorted to narcotic use. More drastically, of those men who were found to be using a narcotic in Vietnam, 75 percent reported they were addicted in that setting. A followup study found that one-third of the drug users continued to use a narcotic when back in the United States. Yet the researchers found that only nine percent of the Vietnam addicted group showed signs of addiction at home (Robins et al. 1974a). These data show how setting determines whether drug use will be addictive or not even when amount and type of drug use remain constant. For in Vietnam, circumstances modified the appeal of the analgesic experience for the individual and the need he had for that experience.

COMPLEXITIES IN ADDICTION

Utilizing the experience produced by a drug as the central element in the definition of addiction does not obviate the role of a drug's pharmacological effects. Powerful psychoactive drugs are obviously the substances which are most directly capable of producing the experience to which an individual may become addicted (although they are not the only causes of such experiences). The nature of a drug's effects is a determinant of the type of experience a user will have, and users may have genuine preferences for different classes of drugs depending on the function they seek a drug experience to provide. Thus, while depressant drugs (those which create analgesic effects), such as the barbiturates, the narcotics, and alcohol, are major objects for drug addiction, stimulant drugs are another class of drugs with addictive potential. For example, laboratory research now indicates that it is not possible to distinguish qualitatively between the withdrawal produced by stimulant drugs, such as caffeine, and narcotic withdrawal (Goldstein and Kaiser 1969). The mechanism of addiction in the case of the stimulant experience is the absorption of the user's attention by the arousal state the drug leads to. This internal stimulation, it seems, makes the drug user less aware of the external stimuli which create tension. Cigarette smokers have been shown to be more tense than nonsmokers but to experience a reduction in tension from smoking that nonsmokers do not report (Nesbitt 1972). In this paradoxical way, a stimulant can create an analgesic effect for certain individuals.

In smoking, as in all addiction, the experience consists of elements in addition to the drug's effects. The chief of these is the ritual associated with the drug use. A substantial portion of heroin addicts will have their withdrawal suppressed simply by undergoing the ritual of injection, without receiving any of the drug (Light and Torrance 1929). Similarly, cigarette smokers will not respond totally to nicotine which is not taken in through inhalation, even if the alternate method for consuming the drug is more efficient (Jarvik 1973). We can understand these phenomena when we note that with both stimulants and depressants, it is primarily the overall reassurance of the drug experience to which the addict is responding. Predictable and habitual aspects of the setting in which the drug is consumed will be as much a part of the addiction as the substance itself.

Addiction to a given drug is not constant from culture to culture. For example, debilitating alcoholism is almost unknown in certain rural Mediterranean societies (Blum and Blum 1969). The evidence is that a culture's attitudes toward a drug influence whether or not the drug will be abused. In particular, societies which have high alcoholism rates are those in which a premium is placed on power but in which it is difficult for one to achieve power. In this cultural context, alcohol intoxication leads to fantasies of personal domination over other people (McClelland et al. 1972). Behaviors which occur in line with this drinking are fighting, crime, reckless driving, and other aggressive and antisocial acts. Compare this to the kind of drinking which occurs in a Greek cafe, where the disinhibition that alcohol produces is used to enhance social conviviality. Not only does the social meaning of alcohol change, but the very processes of thought and feeling which it sets off in the individual can be seen to vary.

Placing the power-oriented drinking syndrome in the addiction cycle, we find that individuals who doubt their efficacy drink in order to gain the illusion of power. Attempts to dominate others while drunk, however, actually lower social standing and contribute to a sense of futility and low self-esteem. Drinking may become the one avenue to a satisfactory--if temporary--self-image, and drunkenness becomes a preferred state. In a culture where intoxication does not produce these feelings and is not taken as an excuse for antisocial behavior, the drinking experience is not one which can serve as the object of an addiction.

SPECIAL POPULATIONS

Doctors as a group have often been singled out for their high incidence of narcotic and other drug use. While many physicians do suffer debilitating effects from their involvement with a drug, there are also indications that many physicians use narcotics for long periods of time without showing such negative effects (Winick 1961a). There are several factors which might make it less likely for narcotic use among doctors to reach an uncontrolled stage. These include the status of their position, the meaningfulness of their work, the self-control required in their training and certification, and so on. Medical doctors, therefore, have come to provide some of the best examples of controlled use of narcotics.

Recent research has modified this picture in important ways. While doctors obviously have advantages in hiding--and even controlling--

their drug involvements, it is now clear that such controlled use is far from exceptional. Investigations among both middle-class users and ghetto residents using narcotics indicate that the percentage of controlled users is high and that these populations do not differ significantly from medical doctors in this respect (Lukoff and Brook 1974). This special population that has been uncovered is not defined by occupation, by economic or social status, or by other demographic factors. It is the group of people who are able to subjugate their drug use to other aspects of a productive life. The factors that have been shown to enable a person to do this include a sense of purpose or mission that dictates times when drug use is not appropriate, sets of friends who are not involved in use of the drug, and models for controlled use either among peers, status figures, or family (Jacobson and Zinberg 1975).

A Family Theory of Drug Abuse

M. Duncan Stanton, Ph.D.

THEORETICAL CONSIDERATIONS

In developing a theory of drug abuse, my colleagues[1] and I were faced with explaining several phenomena in the behavior of drug abusers which were not accounted for by existent theories. One of these is the repetitive, recurrent nature of addiction; related to this is the high incidence of treatment dropouts. We were also dissatisfied with the static theories which predominated in the field--theories which took little or no cognizance of (a) the ongoing behavior in its context, (b) changes and/or repetitive patterns which occurred during a given time period, and (c) the interpersonal and contextual functions of drug abuse (Stanton 1978b). Before proceeding to discussion of a theoretical model, however, there are several conceptual considerations, stemming from these observations, which need further elucidation.

SYMPTOM CONTEXT

A major concern which, again, has too often been overlooked in the drug abuse field pertains to the context of the symptom as this relates to its genesis and its maintenance. There is a need for viable theoretical models which take into account both the actual symptomatic behavior and the behavior of others within the symptom-bearer's interpersonal system. Symptoms generally do not just "pop up." They occur within a context, and most would agree that they serve functions within this context--both for the symptom-bearer and for the other people involved.

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[1] Many of the ideas presented here were developed through a collaborative effort with a number of colleagues, including Thomas C. Todd, Ph.D.; David B. Heard, Ph.D.; Sam Kirschner, Ph.D.; Jerry I. Kleiman, Ph.D.; David T. Mowatt, Ed.D.; Paul Riley; Samuel M. Scott; and John M. VanDeusen, M.A.C. Jay Haley, M.A., also provided important input. A major result of this collaboration has been the conceptual paper by Stanton et al. (1978).

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In fact, some of these others (e.g., family members) may actually have an investment in maintaining the symptom. Consequently, our formulations need to encompass the total "gestalt" of (a) the symptom, (b) the treatment, (c) those affected by the treatment, and (d) the effects these last also have back on the treatment endeavor. This is, then, a cyclical process, involving numerous homeostatic and feedback mechanisms. On this point, Nathan and Lansky (1978), in a recent review of the problems in research on the addictions, have stated, "A frequently ignored issue . . . is that a treatment program may be highly effective in attaining desired goals while patients are actively involved in the program, only to appear to fail when patients return to nonsupportive or destructive environments" (p. 82). It is inclusion of these "nonsupportive" and "destructive" influences which is being stressed here. Treatment does not take place in a vacuum, and if the external variables which impinge before, during, and after treatment are not changed, or at least evaluated, both treatment and investigatory efforts operate at a considerable disadvantage.

NONLINEAR CAUSALITY

In some ways we are addressing the issue of causality here. Much research in the drug abuse field has not enjoyed the luxury of having comprehensive causal models to give direction to its efforts. An important issue surrounding the problem of causality pertains to its linear versus its nonlinear nature. For instance, if one were to regard causality from a linear standpoint, one would assume that A causes B, or that A and B cause C. A nonlinear, or open systems model, on the other hand, would more likely portray the process as a sequence: A leads to B, B leads to C, and C leads back to A. The behaviors of the involved individuals or human systems are sequential and cyclical. We would thus want to look at the components, elements, and specific behaviors which constitute the cycle. The addiction/readdiction pattern is an example of just such a process. Nonlinear causality, while requiring a different approach to the ways in which we think about symptoms such as drug abuse, holds considerable potential for explaining the addiction process. However, from an operational standpoint, it also requires a revision of many of the dependent and independent variables to be examined.

FAMILY LIFE CYCLE

It is helpful to view any family in terms of its place in the family developmental life cycle. Most families encounter a number of similar stages as they progress through life, such as birth of first child, child first attending school, children leaving home, death of a parent or spouse, etc. These are crisis points, which, although sometimes difficult to get through, are usually weathered without inordinate difficulty. On the other hand, symptomatic families develop problems because they are not able to adjust to the transition. They become "stuck" at a particular point or stage. Like a broken record, they repetitively go through the process without advancing beyond it (Haley 1973). This process as it applies to drug users will be discussed below.

DRUG ABUSE AS A FAMILY PHENOMENON

While the emphasis here will be on opiate users under the age of 35, it is my experience and that of my colleagues that most of the patterns and processes described apply to people and families who indulge in heavy, compulsive use of other drugs as well. A number of features will be presented, leading to a family homeostatic model of addiction. Only certain of the pertinent references will be cited, and the reader is referred to Stanton (1978a, 1979b, 1980) and Stanton et al. (1978) for more complete documentation.

TRAUMATIC LOSS

Accumulating data indicate that a high percentage of drug abusers' families have experienced premature loss or separation during the family's life cycle. The relationship between drug addiction and (a) immigration or (b) parent-child cultural disparity appears to be important. Alexander and Dibb (1975) and Vaillant (1966b) discovered that the rate of addiction for offspring of people who immigrated either from another country or from a different section of the United States was considerably higher (three times so for Vaillant's sample) than the rate for the immigrants themselves. In addition, Vaillant found that offspring of immigrants who were born in New York City were at greater risk for addiction than either their parents or offspring born in the former culture. Noting the abnormal dependence of addict mothers on their children, he suggested that (a) immigrant parents are under the additional strain of having to cope with their new environment, (b) parental migration may be correlated with parental instability, and (c) "the immigrant mother, separated as she often is from her own family ties, may be less able to meet the needs of those dependent on her and yet experience greater than average difficulty in permitting her child mature independence" (p. 538). It might be added that immigrant parents are also faced both with the "loss" of the family they left in their original culture and their own possible feelings of guilt or disloyalty for having deserted these other members. In any case, what appears to happen is that many immigrant parents tend to depend on their children for emotional and other kinds of support, clinging to them and becoming terrified when the offspring reach adolescence and start to individuate.

With non-immigrant families of drug abusers, a high proportion show traumatic, untimely, or unexpected loss of a family member, experiencing more such early deaths or tragic losses than would be actuarially expected (Coleman and Stanton 1978). This has led to the idea that the high rate of death, suicide, and self-destruction among addicts is actually a family phenomenon in which the addict's role is to die, or to come close to death, as part of the family's attempt to work through the trauma of the loss; in a sense, addicts are sacrificial and rather noble figures who martyr themselves for the sake of their families (Reilly 1976; Stanton 1977b; Stanton and Coleman 1979).

FEAR OF SEPARATION

Related to this discussion is the intense fear of separation that these families show (Stanton et al. 1978). For instance, addicts do not function well because they are too dependent and not ready to assume responsibility--as if they want to be taken care of. They fear being separate or separated. However, closer observation of the whole family generally reveals that when addicts begin to succeed--whether on the job, in a treatment program, or elsewhere--they are, in a sense, heading toward leaving the family, either directly or by developing more autonomy in general. At this point, some sort of crisis almost inevitably occurs in the family. On the heels of this the addict reverts to some kind of failure behavior and the family problem dissipates. The implication is that not only does the addict fear separation from the family, but that the reverse is also true. It is an interdependent process in which failure serves a protective function of maintaining family closeness. The family's need for the addict is greater than or equal to the addict's need for them, and they cling to each other for confirmation or, perhaps, a sense of "completeness" or "worth."

ADDICT-FAMILY CONTEXT

Some corroboration of the notion that addicts are tied into their families of origin can be obtained simply by observing how often they contact their parent(s). This is a facet of the drug abuser's lifestyle which has generally been overlooked, since it is not obvious that addicts in their late twenties and early thirties would still be so involved; their age, submersion in the drug subculture, frequent changes in residence, possible military service, etc., all seem to imply that they are cut off, or at least distanced, from one or both parents. However, despite protestations of independence, there is increasing evidence that most addicts maintain close family ties. Stanton (1980) has accumulated 14 sources which deal with this idea, and all but one (a poorly designed study, it should be noted) support the close-contact hypothesis. For instance, our own data (Stanton et al. 1978) from an anonymous survey of 85 heroin addicts (average age, 28) showed that 66 percent either resided with their parents or saw their mothers daily, while 82 percent saw at least one parent weekly. Further, similar patterns have emerged in Italy and Thailand, where 80 percent of addicts live with their parents. More recently, Mintz[2] is gathering data in Los Angeles which appear, at this point, to duplicate the above results, and Perzel and Lamon (1979) have identified a similar pattern with polydrug abusers, also finding that the frequency of family-of-origin contact for the abusers was five times that reported for a comparison group of nondrug users. In sum, the accumulating evidence has tended to yield data consistent with a close addict-family tie hypothesis.

FAMILY STRUCTURE

The studies supporting the conclusions in this section are too numerous to cite here, and the reader is referred to reviews by the author (Stanton 1979b,c, 1980) for further documentation. The prototypic drug abuser's family--as described in most of the literature--is one in which one parent is intensely involved with the abuser, while the other is more punitive, distant, and/or absent. Usually the overinvolved, indulgent, overprotective parent is of the opposite sex from the abuser. This overinvolvement may even reach the point of incest, especially with female abusers. Further, the abusing offspring may serve a function for the parents, either as a channel for their communication, or as a disrupter whose distracting behavior keeps their own fights from crystallizing. Conversely, the abuser may seek a "sick" state in order to assume a childlike position as the focus of the parents' attention. Consequently, the onset of adolescence, with its threat of losing the adolescent to outsiders, heralds parental panic. The family then becomes stuck at this developmental stage and a chronic, repetitive process sets in, centered on the individuation, growing up, and leaving of the drug abuser.

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[2] J. Mintz, University of California, Los Angeles, and Brentwood VA Hospital. Personal communication, August 1979.

It is probably most helpful to view the above process as at least a triadic interaction, involving two adults (usually parents) and the abuser. If the drug-using youth is male, the mother may lavish her affections on him because she is not getting enough from her husband, while the husband retreats because his wife undercuts him--as, for example, when he tries to discipline the son appropriately. This kind of thinking is much more attuned to the system, and only a few studies and papers have subscribed to it. In addition, it appears that most family members help to keep the drug abuser in a dependent, incompetent role, the family thus serving to undermine his or her self-esteem. By staying in role and taking drugs, the abuser helps to maintain family stability and homeostasis.

COMPARISON WITH OTHER SYMPTOMS OR DISORDERS

Since a number of disorders, in addition to drug abuse, show a pattern of overinvolvement by one parent and distance/absence by the other, the question arises as to how drug abusers' families differ from other dysfunctional families. Stanton et al. (1978) have tried to clarify this issue, drawing both from the literature and from their own studies. In brief, the cluster of distinguishing factors for addict families appears to include the following: (a) There is a higher frequency of multigenerational chemical dependency--particularly alcohol among males--plus a propensity for other addiction-like behaviors such as gambling and watching television. (Such practices provide modeling for children and also can develop into family "traditions.") (b) There appears to be more primitive and direct expression of conflict, with quite explicit (versus covert) alliances, for example, between addict and overinvolved parent. (c) Addict parents' behavior is characterized as "conspicuously unschizophrenic" in quality. (d) Addicts may have a peer group or subculture to which they (briefly) retreat following family conflict--the illusion of independence is greater. (e) Mothers of addicts display "symbiotic" childrearing practices further into the life of the child and show greater symbiotic needs, than mothers of schizophrenics and normals. (f) Again, there is a preponderance of death themes and premature, unexpected, or untimely deaths within the family. (g) The symptom of addiction provides a form of "pseudo-individuation" at several levels, extending from the individual-pharmacological level to that of the drug subculture. (See discussion that follows.) (h) The aforementioned rate of addiction among offspring of immigrants is greater than might be expected, suggesting the importance of acculturation and parent-child cultural disparity in addiction.

SYMPTOM FUNCTION

It is legitimate to ask what functions the symptom of drug abuse might serve within an interpersonal or family system. Stemming from earlier discussion of the interdependency and fear of separation that addict families show, drug addiction, especially to heroin, does indeed appear to have many adaptive, functional qualities in addition to its pleasurable features. The major conclusion is that it provides addicts and their families with a paradoxical resolution to their dilemma of maintaining or dissolving the family. The drug's pharmacological effects and the context and implications of its use furnish solutions to this dilemma at several different levels, from individual psychopharmacology to the drug subculture. These functions are described below, and, again, rather than listing the various studies upon which they are based, refer to the original review by Stanton et al. (1978).

The Individual-Pharmacological Level

Several writers have conceptualized the addict's experience of euphoria as analogous to a symbiotic attachment or fusion with the mother--a kind of regressed, infantile satiation. If so, while in this state the addict can feel "close" to mother or family, and also in some ways appear to them much as a child who is clearly not autonomous. On the other hand, heroin blunts the anxiety accompanying separation and individuation, often causes drowsiness, and in effect allows the addict to be separate, distanced, and self-absorbed while physically present. The drug allows both closeness, or infantile behavior, and distance at the same time.

Aggressive Behavior

When an addict succeeds or improves, we have noted that family turmoil often ensues. The family seems to be covertly urging the addict to remain incompetent and dependent. Heroin, on the other hand, has been noted to give a sense of new power, omnipotence, and "triumphant success." Perhaps more important is the point made by Ganger and Shugart (1966), however, that under the influence of heroin, addicts become aggressive and assertive toward their families, particularly their parents. In so doing they become autonomous, individuated, and "free." They appear to stand up for themselves, but do not really. This is actually pseudo-individuation, for addicts' ravings and protestations are typically discounted by the family. The drug is blamed. Without it they "really aren't that way." Through the drug cycle the whole family becomes engaged in a repetitive reenactment of leaving and returning in which the "leaving" phase is neutralized through denial of the possible implications of the addict's assertiveness. In short, the family is saying, "You don't really hate us--you're just high," and when not influenced by drugs, the addict concurs with, "Yes, I don't really hate you, but when I'm on the drug I can't control myself."

Heterosexual Relationships

Heroin may offer a compromise in the area of heterosexual relationships. Addicts have been noted not to have teenage crushes, to be more likely than average to engage in homosexual activities, or to be retreating from sexuality. Intense family ties can serve to prevent the addict from developing appropriate relationships with spouses or offspring. It may be true that the drug produces a kind of sexual experience, which would partially explain the colorfully eroticized language and loving tenderness that addicts attach to various aspects of their habit; they seem to be addressing it as a love partner. Since it apparently reduces the sex drive also, it can in this way again provide a solution to the addict's dilemma. Through it they can have quasi-sexual experiences without being disloyal to their families, particularly their mothers. They do not have to form heterosexual relationships but instead can relate sexually to the drug.

The Drug Subculture

Other aspects of heroin addiction can help addicts out of their dilemmas, especially those pertaining to extrafamilial systems. Addicts form relationships among members of the drug subculture. They "hustle" and make a lot of money to support their habit. Thus they have friends or peers and are in this way grownup, independent, and "successful." Paradoxically, however, this is not the case, for the more heroin they shoot, the more helpless, dependent, and incompetent they are. In other words, they can be successful and competent only within the framework of an unsuccessful, incompetent subculture. It is a limited realm, restricted to people who need help and cannot really be expected to function adequately within society.

Abstinence and the Addict Role

Previously, it was noted how the drug may serve as a problem which keeps the family together. In this way it transcends its pharmacological effect; it serves more as a symbol of the addict's incompetence and consequent inability to leave the family, or the family's inability to release the addict. Much has been made of the euphoria in drug addiction, but our experience indicates that this is secondary to its function within the family. Given appropriate support, the addict can, for example, tolerate large decreases in methadone levels. By far the greatest resistance is in the final step of going from five mg to zero. It is an easy step to take, pharmacologically, and its real significance is symbolic. Once this step is taken, the addict is no longer an addict and is making an assertion against the roles played and against the mantle of incompetence. Should the family still need someone in the position of the addicted one, they can bring almost unbearable pressure to bear--so much so that it may cause the addict to slip once again into the addictive cycle.

A HOMEOSTATIC MODEL

The model presented here is of the nonlinear kind and stems from a theoretical tradition extending at least from the earlier works on family homeostasis and triadic systems of Jackson (1957) and Haley (1967, 1973). This model has been presented in more complete form elsewhere (Stanton et al. 1978). In essence, it is proposed that drug addiction be thought of as part of a cyclical process involving three or more individuals, commonly the addict and two parents. These people form an intimate, interdependent, interpersonal system. At times the equilibrium of this interpersonal system is threatened, such as when discord between the parents is amplified to the point of impending separation. When this happens, addicts become activated, their behavior changes, and they create situations that dramatically focus attention upon themselves. This behavior can take a number of forms. For example, they may lose their temper, come home high, commit a serious crime, or overdose on drugs. Whatever its form, however, this action allows the parents to shift focus from their marital conflict to a parental overinvolvement with the child. In effect, the movement is from an unstable dyadic interaction (e.g., parents alone) to a more stable triadic interaction (parents and addict). By focusing on the problems of the addict, no matter how severe or life threatening, the parents choose a course that is apparently safer than dealing with long-standing marital conflicts. Consequently--after the marital crisis has been successfully avoided--the addict shifts to a less provocative stance and begins to behave more competently. This is a new step in the sequence. As the addict demonstrates increased competence, indicating the ability to function independently of the family--for example, by getting a job, getting married, enrolling in a drug treatment program, or detoxifying--the parents are left to deal with their still unresolved conflicts. At this point in the cycle, marital tensions increase and the threat of separation arises. The addict then behaves in an attention-getting or self-destructive way, and the dysfunctional triadic cycle is again completed.

This cycle can vary in its intensity. It may occur in subdued form in treatment sessions or during day-to-day interactions and conversations around the home. For example, a parent hinting at vacationing without the spouse may trigger a spurt of loud talking by the addict. If the stakes are increased, the cycle becomes more explosive and the actions of all participants grow more serious and more dramatic, e.g., the parents threatening divorce might well be followed by the addict's overdosing. Whatever the intensity level, however, we have observed such patterns so often that we have almost come to take them for granted. Viewed from this perspective, the behavior of the addict serves an important protective function and helps to maintain the homeostatic balance of the family system.

The onset of the addiction cycle appears in many cases to occur at the time of adolescence and is intensified as issues of the addict's leaving home come to the fore. This developmental stage heralds difficult times for most families and requires that the parents renegotiate their relationship--a relationship which will not include this child. However, since the parents of the addict are unable to relate to each other satisfactorily, the family reacts with intense fear when the integrity of the triadic relationship is threatened. Thus we find that most addicts' families become stabilized or stuck at this developmental stage in such a way that the addict remains intimately involved with them on a chronic basis. In addition to staying closely tied to the home, the failure to separate and become autonomous may take several other forms, and the child may (a) fail to develop stable, intimate (particularly heterosexual) relationships outside the family; (b) fail to become involved in a stable job, school, or other age-appropriate activity; (c) obtain work which is well below his or her capabilities; (d) become involved in criminal activities; (e) become an addict.

THE ABUSER'S FAMILY OF PROCREATION

Concerning marriage and the family of procreation, it has generally been concluded that the (usually heterosexual) dyadic relationships that abusers, especially addicts, become involved in are a repetition of the nuclear family of origin, with roles and interaction patterns similar to those seen with the opposite-sex parent. (See Stanton 1979b and 1980 for a review of studies supporting this and subsequent conclusions.)

In a certain number of these marriages both spouses are addicted, although it is more common for one or neither or them to be drug dependent at the beginning of the relationship. If the marital union is formed during addiction, it is more likely to dissolve after methadone treatment than if initiated at some other time. Also, nonaddicted wives tend to find their husbands' methadone program to be more satisfactory than do addicted wives. Equally important, the rate of marriage for male addicts is half that which would be expected, while the rate for multiple marriages is above average for both sexes. A number of authors have noted how parental permission is often quite tentative for addicts to have viable marital relationships. They often flee into marriage only to return home, defeated, as a result of parental influence or "pull."

In our own studies of male addicts (Stanton et al. 1978) we have noted that if the addict had not "checked in" at home recently or if the parents had some other reason to fear they were "losing" him, a crisis often occurred in their home--often a fight between them--and the son was alerted to it. At that point he was apt to start a fight with his wife--a move which served two purposes. It showed the parents that they had not lost him to marriage, and it gave him an excuse to return home to help, since he had "no place else to go." Usually he succeeded in diverting attention from the problem in the parental home and once again functioned to reduce conflicts between adults.

At other times the precipitating event(s) were less obvious and he and his wife fell into a cycle of periodic altercations. Their temporal regularity seemed almost servo-controlled.[3] These appear to be maintenance cycles. They may not have resulted in his moving out, but instead he would show up with some regularity at his parents' home to complain about connubial problems. He seemed to be saying, "I just dropped by to let you know that things aren't going well and you haven't lost me." (In one case, every time the addict's mother called him, he would tell her he had just had a fight with his wife, even if he had not--an ingenious way of keeping both systems simultaneously intact and pacified.) Marital battles thus became a functional part of the intergenerational homeostatic system, possessing both adaptive and sacrificial qualities.

SINGLE-PARENT FAMILIES

In many drug abuser families-of-origin, one parent (usually father) is absent. In such cases, one would think that a triadic model (as above) would not apply, and that a dyadic framework, e.g., one encompassing mother and son, would be more fitting. It would also appear to be more parsimonious and less complicated. Nonetheless, we have found (Stanton et al. 1978) that when the matter is pursued closely, a third important member generally pops up as an active participant in the interaction. Usually the triadic system is of a less obvious form, such as a covert disagreement between mother and grandmother, or mother and ex-husband. This is consonant with a point made emphatically by Haley (1976) that at least two adults are usually involved in an offspring's problem and that clinicians should look for a triangle consisting of an overinvolved parent-child dyad and a more peripheral parent, grandparent, or parent surrogate. Thus it has been our experience that in addition to the (male) addict and his mother, the triad may include mother's boyfriend, an estranged parent, a grandparent, or some other relative. These alternative systems appear to exhibit patterns and cycles similar to those in which both parents are present and, again, revolve around interruption by the abuser of conflicts between adult members. However, achieving separation and independence is even more of an issue in single-parent families, since mother may be left alone with few psychological resources if the drug abuser departs.

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[3] In this case, "servo-controlled" refers to an automatic return to a prior behavioral state, once a certain limit (i.e., the end of a time period) is reached.

Self-Esteem Theory of Drug Abuse

R. A. Steffenhagen, Ph.D.

To be of value a theory must predict as well as explain the phenomena after the fact. The self-esteem theory postulates that all behavior is mediated by the individual's attempt to protect the "self" within the social milieu.

This theory is a developmental one emanating from an Adlerian approach in which self-esteem is seen as the main psychodynamic mechanism underlying all drug use and abuse. The self-esteem concept develops out of Adler's Individual Psychology, more precisely the Psychology of Self-Esteem, in which the underlying motive of human behavior is the preservation of the concept of the "self" (Ansbacher and Ansbacher 1956). The preservation of the concept of "self" is the most important variable in understanding the initiation, continuation, and cessation of drug use, and further explains why the rehabilitation process frequently results in relapse.

The theory will not only account for the initiation into drug use (the social milieu) but will determine the course the pattern will take (vis-a-vis self-esteem) in terms of continuation, cessation, and/or relapse. The etiology of drug use does not lie in the personality of the individual (addiction proneness) or in family constellations (drug use as a behavioral model), but in availability, social acceptability, and social pressure. It must be noted that the type of dependency is conditioned by the culture. Dependency on amphetamines, for example, could not have existed before their discovery in the early 1900s, medical use in the 1930s, and post-World War II street use. Alcohol (as a social drug) was the main drug of abuse until the post-World War II period in the United States, and marijuana was the drug of abuse in India. Today, these two countries are in a state of social change, and the youths of both countries are becoming users and abusers of socially unacceptable drugs--marijuana in the United States and alcohol in India (Cohen 1969). Thus, the culture determines the types of drugs available, while social pressure and social acceptability further determine the type and pattern of use. Social pressure may lead one both into and out of drug abuse. This has become evident in some of the street gangs in New York City, where youths would become addicted to heroin because of peer pressure and then would later cease as a result of the same pressure. A similar situation was true in Vietnam, where many of the soldiers who became addicted to heroin were subsequently cured of their addiction. The reasons for relapse will be discussed later.

The theory incorporates several of Adler's key concepts. Self-esteem does not emerge full blown at birth but is developed slowly during the socialization process. The foundation is developed early in life and is present at the time the prototype of the personality is formed. This does not mean, however, that self-esteem cannot be changed positively or negatively later, since the individual is very much responsive to social pressure. The concepts which will be elucidated in this paper are (1) inferiority-superiority, (2) social interest, (3) goal orientation, and (4) lifestyle. In the context of this discussion, the development of self-esteem and the social milieu will be looked at to explain how social pressures affect the individual.

INFERIORITY AND SUPERIORITY

Paramount to Adler's Individual Psychology are the concept(s) of inferiority and superiority. All children begin life in an inferior position, and much of their early socialization consists of learning to cope with feelings of inferiority. Exposed to an adult milieu, they perceive themselves as small and weak, inadequate and inferior. Learning to cope with these inferiority feelings, which dominate the behavior of all individuals to a lesser or greater degree, becomes the basis for goal orientation. The uniqueness of human beings stems from their means of dealing with these feelings, their style of life. Coping mechanisms are developed in accord with individual choices (as Tillich says, "Man is his choices.") or goals, which can only be understood in relationship to lifestyle and social milieu. The feelings of inferiority reflect the extent to which the individual perceives himself/herself as able or unable to obtain goals. The ability to attain goals is the result of psychological, biological, and sociological factors, while the technique chosen to deal with inferiority is the result of a person's lifestyle.

On the other hand, expressions of superiority can become a compensatory mechanism in which the individual's overt behavior becomes a mask for inner feelings of inferiority.

SOCIAL INTEREST

Foremost in the development of a healthy personality is the development of social interest, because it is only through social participation that the individual can deal with feelings of inferiority and develop high self-esteem. Within the Adlerian paradigm, lack of social interest is always present in a neurotic person. Humans are social animals, and most conscious behavior is spent in contact with other individuals in the normal pursuit of work, play, and raising a family. The fundamental conditioning technique during the socialization process centers around praise and blame. Praise is good for the ego and helps in the development of self-esteem when it is given for socially useful actions. When the mother's rewards are given for actions which are socially useless or in such a pampering fashion that the individual only gets rewards for exemplary behavior, feelings of self-worth and good self-esteem do not develop.

Good social interest can be developed only as a result of other-directedness, i.e., a concern for others. Other-directedness is a primary phenomenon that is healthy in conjunction with socially useful goals.

GOAL ORIENTATION

Goal orientation is very important to self-esteem theory, because success and failure can only be understood subjectively and not objectively; outward symbols of success must be understood in terms of the individual's own perceptions. Those who, to others, seem to have the world by the tail may see themselves as failures (e.g., Marilyn Monroe). In this respect, Adler says,

> In this psychological schema there are two approximately fixed points: the low self-estimation of the child who feels inferior, and the over-life-sized goal which may reach high as god-likeness. Between these two points there rest the preparatory attempts, the groping devices and tricks, as well as the finished readiness and habitual attitudes.
>
> (Ansbacher and Ansbacher 1956, p. 245)

Insecurity in childhood causes the individual to set high goals and to develop compensatory safeguarding measures: "If I didn't have this headache, I would have done better" or "If I hadn't drunk so much last night but had studied, I would have done better on my exam." The individual may well resort to drug abuse as a coping mechanism.

Individuals are constantly striving for superiority; all behavior is an effort to achieve success (positive situations) and to overcome obstacles (negative situations). Motivation is a goal-directed drive; lack of motivation is a symptom, not the cause, of neurotic behavior.

To cope with over-life-sized goals and low self-esteem, the individual may turn to drug abuse.

LIFESTYLE

Adler defined lifestyle as "the wholeness of his individuality" (Adler 1933), the guiding line of the personality. He originally called it "Lebensplan" (life plan), then "Lebenstil" (lifestyle), and finally, style of life. He further says,

> In other words the child must have formed a guiding line (Leithinie), a guiding image (Leithbild) in the expectations thus best to be able to orient himself in his environment and to achieve satisfaction of his needs, the avoidance of displeasure, and the attainment of pleasure.
>
> (Adler 1912, p. 33)

Max Weber (1974) was the first to use the concept of lifestyle to refer to a way of life of a subculture--a group-guiding principle. Adler

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used it to refer to the individual's guiding principle. Thus, lifestyle refers to the individual's orientation toward social behavior--the guiding line of the personality, the core around which the personality revolves. Lifestyle is the whole which unifies the parts.

It is the uniqueness of humans that made Adler call his theoretic development individual psychology, stressing this uniqueness. Every person is the same as every other, and every person is different from every other: Culture is the unifying principle.

There are two forms of deviant lifestyle--pampered and neglected. A pampered lifestyle results from an overprotective mother who takes all responsibility for her child's behavior, preventing the child from developing a feeling of self-worth from his or her own accomplishments. Here rewarding success does nothing to establish a feeling of self-worth. Approval and reward are seen as coming only from superior performance. Love is perceived as a response to this performance rather than as a feeling for himself or herself as a person, producing very weak self-esteem.

The counterpart of the pampered lifestyle is the neglected lifestyle of the impoverished environment, in which the individual receives almost no attention and is left to his or her own devices. The patterns of drug abuse as coping mechanisms may vary between these two polar situations, for example, heroin addiction among ghetto youths and marijuana abuse among middle-class college youths (Steffenhagen 1974). Today we see marijuana abuse among lower class youths and heroin addiction increasing among the middle/upper middle-class youths, showing that the type of abuse is a function of the zeitgeist as well as the availability of the drug, which may account for the kaleidoscopic nature of the present drug scene.

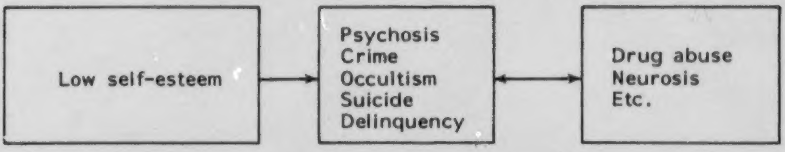
SOCIAL MILIEU

Sutherland's (1939) differential association theory of deviance is directly applicable to our Adlerian model. Adler was keenly aware of the role of society in shaping the individual's behavior. Differential association has a direct impact upon the form deviance will take, given low self-esteem. Sutherland postulates that deviance is learned and that the internalization of such behavior is a function of duration, frequency, intensity, and priority of deviant associations. It becomes clear in the college milieu that the more time an individual spends within a drug-using group, the more likely he or she is to use drugs. Becker and Strauss (1956) clearly indicate the role socialization plays in this situation. I mentioned previously how heroin use became a problem in Vietnam. Boredom and social stress, which led to a need for a social release of tension, and the acceptance of heroin by the peer group were sufficient criteria for the development of a drug problem without any need for neurotic coping mechanisms. This is an example of individuals with relatively high self-esteem becoming drug abusers as a result of the social milieu. The relevance of this to the rehabilitation process will be discussed in detail later.

Peer pressure during adolescence is particularly powerful. The need for acceptance, while always an important drive, is especially strong during this formative period, and helps to account for the heavy drug use in the youth subculture. The pressure is not always overt or obvious but may be covert or subtle: The fact that an activity may be the agent around which the group coalesces may provide the impetus for experimentation. In the case of marijuana, differential association is particularly important since the individual must associate with users in order to try the drug and then to obtain a supply. Both the preference resulting from association and the necessity prevail.

SELF-ESTEEM AND DEVIANCE

As I have said, who will become a drug user or abuser cannot be explained on the basis of any single psychodynamic factor but must take account of the social milieu. Our postulate is that an individual with low self-esteem will become a prime target for drug abuse as a result of the prevalence of drug information--true or false--provided by the mass media. Behavior accompanying low self-esteem can best be explained by the following model:



The behavior need not occur singly, but can also occur in combination. Gross multiple-drug users in college show more emotional disturbance than the nonusing population (McAree et al. 1969, 1972), indicating neurosis coupled with drug abuse. In 1974 I further postulated that drug abuse (and neurosis) may also move toward the occult in which case the drug use may continue or be replaced by the occult support. Participation in the occult may provide an immediate source of power as a coping mechanism or may provide a form of group self-esteem (Lieberman et al. 1973).

In the lower class, low self-esteem may take the forms of neurosis, drug abuse, and delinquency. In this milieu, drug abuse and delinquency are a much more likely pair than drug abuse and occultism. The occult appeals largely to the intellectually curious, especially college students. In both social classes, we may find drug abuse and suicide pairing together. Alcoholics are much more likely to commit suicide than are nonalcoholics:

> Drug abuse is seen generally as an expression of the pampered life style. Its function is to safeguard low self-esteem; enabling individuals to shirk responsibility, while blaming others and outer circumstances, providing excuses, and enabling them to maintain excessively high goals without expending energy.
>
> (Steffenhagen 1974, p. 249)

It is important to realize that while low self-esteem is postulated as the underlying psychodynamic mechanism for drug abuse, it is not a sufficient or necessary condition for initiation. The social milieu can also provide the impetus (differential association plus existence of the drug). The initiation into drug use may then stem from the social milieu, but the abuse of the nonaddicting drugs would be associated with low self-esteem. Further, although a cessation may be superimposed by the social structure, relapse would be likely to occur in the case of low self-esteem. As in the example of Vietnam and heroin, the impetus came from the social situation--drug use continued as long as the social situation remained constant, whereas when the situation changed cessation occurred. We have two possible outcomes: (1) the individuals with good self-esteem remained drug free whereas (2) those individuals with low self-esteem were likely to relapse since an already tried neurotic coping mechanism was within their repertoire.

I also postulate that self-esteem is important in determining the effect that stress will have upon the individual. A person with low self-esteem will respond much more negatively to stress than a person with high self-esteem. In the case of the pampered lifestyle the individual may function adequately as long as he or she has the support system provided by the family but may quickly resort to neurotic coping mechanisms when this support system is removed--such as by the death of parents or by merely going away to college.

CONCLUSION

The following paradigm is offered:

Self-esteem + Lifestyle + Personality + Goal orientation +
Primary group + Social milieu = Behavior

Self-esteem--high or low
Lifestyle--pampered or neglected
Personality--normal or neurotic (includes inferiority and social interest)
Goal orientation--realistic or unrealistic
Primary group--supportive or unsupportive
Social milieu--excess of definitions for conformity or deviance

These are not mutually exclusive categories, since they all interrelate, and the lifestyle of the parent is superimposed upon the child. Self-esteem is posited not as the apex of the personality but the foundation.

The theory postulates that the psychodynamic mechanism underlying drug abuse is low self-esteem. Self-esteem develops through experiential behavior involved in mastery, the ability to master situations and achieve one's goals. Low self-esteem may result either from setting goals too high or from not achieving realistic goals because of a lack of confidence in the ability to attain them. The latter situation may happen when a parent or a significant other does everything for the child, never allowing him or her to develop talents for mastery. William James' formula, success over pretentions equaling self-esteem, reflects this situation (James 1890, p. 310). This is not solely a result of intrapsychic processes but also of the social order. Goals are set by the individual (the individual's uniqueness), but they are provided by the social system. According to Merton (1938), success as defined by the American credo is largely equated with the attainment of money. This is further evidenced by the fact that America is a secular/materialistic culture, as opposed to a religious/spiritual culture (Roszak 1975). The American credo provides the basis for the goals (which sociologists frequently call aspirations), but the social structure does not always provide the means (expectations) for attainment. However, although many forms of deviance cannot be explained solely within the framework of this perspective, e.g., marijuana use among the youths of today, nevertheless we must look to the social milieu for part of the answer.

Even when the goals prescribed by the culture are not readily attainable due to social deprivation, low self-esteem is not inevitable. The individual may be able to lower goals appropriately so that attainment is possible, and thereby achieve satisfaction and develop a feeling of self-worth.

All behavior is goal directed or goal striving--it is the energizing state of the organism. Since all behavior becomes goal striving, individuals evaluate themselves in terms of their perceptions, their evaluation of themselves in terms of achievements. High self-esteem is achieved when the evaluation is good and socially useful; when the evaluation is bad or on the socially useless side of life, low self-esteem results. Thus, it becomes apparent that self-esteem is the key variable underlying drug abuse. If individuals feel inadequate (inferior), they feel a need to protect their poor self-image, frequently through compensatory mechanisms which create further problems in interpersonal relations and add to the feelings of inferiority.

Our theory also helps us explain why Alcoholics Anonymous (AA) and Synanon are only rehabilitative[1] and not curative. It is generally accepted that alcoholics are never cured but remain functional only as long as they remain active in AA, and a similar condition seems to prevail for the members of Synanon and even Weight Watchers. It is our contention that this can be easily explained within the self-esteem theory, because both of these organizations do nothing to build individual self-esteem but, rather, build a form of group self-esteem resulting from and depending on group support cohesion (as the pampering mother). All of these organizations provide a socialization function, and the individual is socialized to remain problem free only within the framework of the group.

With the self-esteem theory we can explain nonuse, social use, and abuse of drugs as well as why various therapeutic models are or are not successful. It is possible that an ex-AA member may remain sober, but this can be explained within the context of the support system or unique circumstances where the drug as a coping mechanism loses its function as a self-esteem protecting mechanism.

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[1] By rehabilitation I mean that the individual is returned to a state of "normal" functioning but not cured of the pathology, which can become reoperative due to trauma.

Biological, Psychogenic, and Sociogenic Factors in Drug Dependence

W.K. van Dijk, M.D.

INTRODUCTION

It should be clear from the start that the following considerations are presented by a clinical psychiatrist. This means that the viewpoint from which the dependence theme will be inspected is largely determined by experiences with the treatment and rehabilitation of individuals who have fallen victim to the problems of abuse of drugs and with the prevention of relapse.

DESCRIPTION

The state of dependence as a behavioral syndrome is characterized by the fact that the person concerned cannot live without the drug he or she is dependent on. This inability may take different forms and grades which depend, amongst other things, on the type of drug. With alcohol we sometimes observe that for some reason the alcoholic is able to abstain for days or weeks or even months; in case of heroin, however, the ability to stop taking the drug is restricted to a few hours only. In either case, there arises after a shorter or longer interval, more or less spontaneously, a state of inner tension in which the dependent person feels an uncontrollable craving for the drug. Apart from the type of drug used, these differences are influenced by the personality structure, social factors (including treatment), and

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This paper is reprinted with permission from Prof. Dr. van Dijk's "Complexity of the Dependence Problem: Interaction of Biological with Psychogenic and Sociogenic Factors," in Biochemical and Pharmacological Aspects of Dependence and Reports on Marijuana Research, ed. H.M. van Praag (Haarlem, The Netherlands: Bohn, 1971), pp. 6-18.

probably also by the duration of the state of dependence. In some cases dependence is consistent with a more or less normal way of life, in others it is not. In the latter case the clinical term "addiction" may be used. It should be noted that this definition of dependence and addiction does not include nor exclude physiological mechanisms. The terms are used descriptively to characterize behavior or ways of living.

It is useful not to look at dependence, including addiction, as a separate entity only, but to keep in mind that it must be regarded as the final stage of a process. We may roughly sketch the natural history of the use of a drug leading to dependence as follows.

The first stage is the contact with the drug, which may take place in a medical or a nonmedical setting. After one or more contacts the process may come to a halt, or it may develop into the second stage--experimentation.

The stage of experimentation may assume different forms as to its picture, intensity, and duration, depending on several factors which will be discussed later. After some time has elapsed, the second stage may come to an end, or it may develop into a stage of socially tolerated use which from a psychiatric point of view may be called an integrated mode of use, or it may lead to the stage of excessive use.

The stage of excessive use often carries several risks and damages, which may be of a physical, psychical, or social (interpersonal, economic, legal, moral, etc.) nature. What is to be regarded as a risk or a damage depends largely on the prevailing social habits and customs, on the economic and historical situation, etc. The psychiatrist is inclined to speak of excessive use when there is the threat of an impairment of social, psychological, or physical functioning; certainly this stage will be so labelled if actual damage in one field or other can be demonstrated as being related to the drug habit.

The stage of excessive use as part of a process should be distinguished from incidental excessive use and from periodical excessive use caused by psychiatric factors like recurring depression or epilepsy. It is a more or less continuous state.

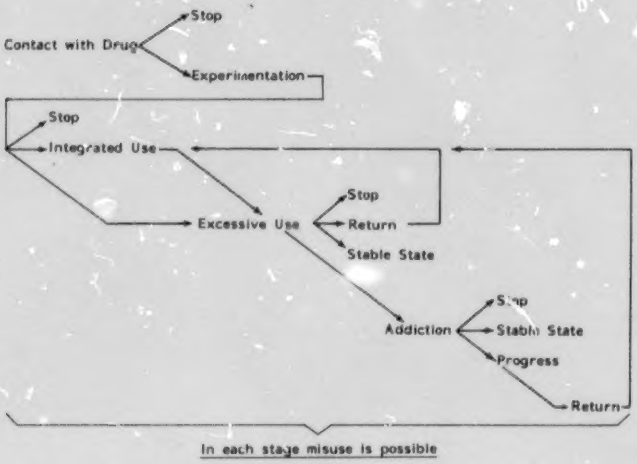
In a percentage of cases this phase may develop into the syndrome of addiction, which is a more or less terminal state. On the other hand, stopping the excessive use, or a return to integrated use may occur.

The development of the use of a drug leading to dependence is recapitulated in figure 1.

Addiction, which is the extreme form of dependence and which may be considered an illness, is a syndrome showing three main features:

1. It is damaging to the individual.
2. It is relatively autonomous. By this we mean that, whatever complex interplay of factors may have led to the phases of excessive use and addiction, once the boundary has been passed, a relatively stable state has come into being, which is more or less independent of the primary generating causes and conditions. As for the treatment, relative autonomy means that in the majority of cases merely removing the initiating factors is not sufficient; special measures have to be taken, aiming at treating the addiction syndrome as such.

FIGURE 1.—***Stages in process of drug use***


Contact with Drug
Stop
Experimentation
Stop
Integrated Use
Excessive Use
Stop
Return
Stable State
Addiction
Stop
Stable State
Progress
Return
In each stage misuse is possible

3. The addiction syndrome is self-perpetuating, spontaneous recovery being exceptional. On the contrary, if no help is offered there is a tendency to further deterioration.

The courses the process can take in the individual case, the successive stages, and the final state show great variety, depending on the drug involved, the personality structure of the user, and the social context.

During the development of dependence several changes in the features of the stages of drug use occur. They may be described as in figure 2.

Earlier phases (contact, experimentation)		Later phases (excessive use, addiction)
More freedom	→	Lack of freedom
Less risks and damage	→	More damage
Abuse possible	→	Abuse present
No illness	→	State of illness
Operating factors linear	→	Vicious circles

FIGURE 2.—Some shifts in characteristics of stages of drug use

ETIOLOGY

GENERATING FACTORS

Extensive research has so far failed to show one simple cause which initiates the process of pathological use of drugs. On the contrary, both research findings and clinical work have made it clear that a complexity of causes and conditions gives rise to the drug-taking process. We may summarize these factors as follows.

Pharmacological Effects of the Drug

We may roughly locate the various drugs on a scale. On one side are the drugs with a strong addictive action (e.g., heroin and morphine), on the other are those to which an addictive power can scarcely be ascribed (e.g., aspirin, chlorpromazine, laxatives, or even petrol or vinegar). The addictive property of a drug depends on the somatic and psychic influences it exercises; in what way these are connected with the chemical structure is largely unknown. All of the addictive drugs have an influence on the feeling or mode of experience of the user.

For practical reasons we may divide them according to their effects: sedating, stimulating, and psychedelic. In all cases, the drug is taken for its desired action. What in a given case is regarded as desired depends on the following factors.

Personal Factors of the User

In this dimension, too, we can make a scale with at its extremes persons who have a strong disposition toward excessive use and addiction and those who are scarcely susceptible to it. The former type can be seen to incline toward a dysfunctional use even of nonaddictive or hardly addictive drugs. Often with these persons a triad of features can be found.

1. Feelings of discomfort, tension, and displeasure may easily arise in them, as a result of mild frustrations or even "spontaneously."

2. These unpleasant feelings are very intense or nearly unbearable.

3. They find it impossible to master, sublimate, and canalize such feelings.

The drug may be used to seek relief from the state of tension. To the group of persons not disposed toward abuse belong those in our culture who are impervious to alcohol, tobacco, tea, coffee, sweets, etc.

The personal factors should not be considered to form an invariable and stable system. Age, for example, is an important modifying factor; during puberty and adolescence the risk appears to be increased.

Physical and psychiatric diseases with a debilitating influence should also be kept in mind as predisposing factors.

Social Meaning and Value of a Drug and Drug Taking

Along this dimension, factors like the drug being accepted in the culture or being considered alien to it play a role (cf. the acceptance or rejection of alcohol or opiates in some Eastern and Western cultures). Furthermore, the ritualization of the use of a drug, and the social norms, habits, and sanctions governing it, including the legal regulations and jurisdiction; the load of sensation and thril ; the significance of a drug as a symbol of sturdy, competitive, aggressive masculinity, or of a noncommittal, nonaggressive attitude and mode of behavior; the function of a drug or of using drugs as a symbol and a signifier of differences between groups, classes, and generations: to the group the user is the insider and the nonuser is the outsider, while, conversely, the user is the outsider in society in general; the function of a drug or of drug taking is a symbol of a progressive, nonauthoritarian attitude, etc.

The social meaning of a drug and of drug taking is not only important as an incentive to take drugs, but also as a factor which may have an important influence on the effect of a drug. Here lies a connection with the general pharmacological problem of the placebo effect and of the difference between reactors and nonreactors.

Environmental Influences on the User

These can be divided into positive factors, leading to a favorable reaction of the person, and negative ones, causing too great, too small, or inadequate stress. This dimension is of course connected with the second one, above. The same social situation and influence may be experienced by one person as a positive stimulus and as too heavy a burden by another, which he or she may try to get rid of by means of the use of drugs.

In each individual case the drug-using process starts and develops from the interplay of factors from the dimensions mentioned above; figure 3 summarizes these.

Factors Maintaining the Process After Contact with the Drug

After this brief discussion of the generating factors of the drug-using process, some short remarks will be made about the factors maintaining the process after contact with the drug has been made. This pertains to the question why dependence continues, in spite of its unfavorable effects. We can study these factors best in the case of addiction with its self-perpetuating character. There is as yet no adequate explanation for this remarkable feature of addiction. In my opinion, however, there are strong indications that an important pathogenic part is played by the mechanism of vicious circles.

A vicious circle may be described as a circular process in which a cause generates a result, which in its turn maintains or reinforces the initial cause. In addiction we may distinguish four vicious circles.

Pharmacological Vicious Circle

Pharmacological investigations have shown that the repeated use of drugs may cause a change in metabolism. This change may manifest

1. Pharmacological properties:

Strongly addictive drugs (e.g., morphine, heroin)	Non-addictive drugs (e.g., aspirin, laxatives, vinegar)

2. Personal factors:

Strong disposition to excessive use	No disposition to excessive use

3. Social meaning and value: Drug accepted or rejected, ritualization, social norms and sanctions (including legal regulations, police actions and jurisdiction), symbolic significance

4. Environmental influences:

Negative factors	Positive factors

FIGURE 3.—Operating factors in the etiology of the process of drug use

itself in the phenomenon of tolerance (after prolonged use an increase of the dose is needed to attain the same effect) and the withdrawal syndrome (a sudden interruption may cause unpleasant and even serious physical and psychological signs and symptoms). In some types of dependence, the persistent need for the drug and the inclination to increase the dose may be explained by these phenomena. Continuation of the use, however, maintains the metabolic change, which in its turn is responsible for the need to use the drug again. Cause and effect influence each other by means of pharmacological mechanisms. This is the reason we speak of a pharmacological vicious circle, illustrated in figure 4.

Cerebral Vicious Circle

In some cases the quantitatively and qualitatively excessive use of a drug may have a direct damaging influence on those cerebral functions that form the basis for regulation and integration on the behavioral level. The outcome is a weakening of the strength of the ego. This means that the personal psychical powers to regulate and control the use are reduced. This, in its turn, implies that the motives leading to the use of the drug get the opportunity to assert themselves more easily. Because of this mutual relationship of cause and effect one can also speak of a vicious circle. See figure 5.

Psychic Vicious Circle

This refers to the effects of dysfunctional use in the mental field. In this case, feelings of guilt and shame, the unpleasant notion that decreasing or abstaining from use would be better, and the disagreeable perspective of the future, etc., play an important role. The easiest and most effective way to get rid of these annoying feelings is to take the drug, and in this way a vicious circle is started. Moreover, we may point at the infantomimetic effect of the use of drugs. By this is meant a regression to a more infantile form of behavior with an increase in the affective and instinctive aspects of behavior and a decrease in

FIGURE 4.—*Pharmacological vicious circle*

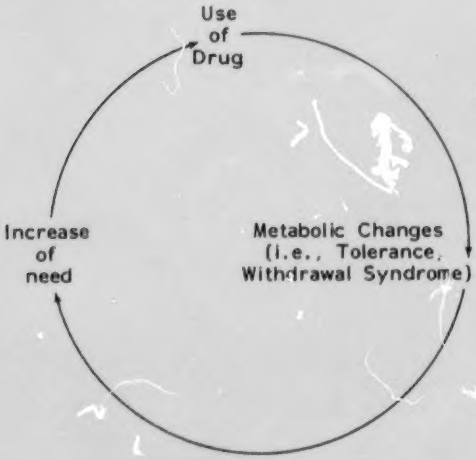
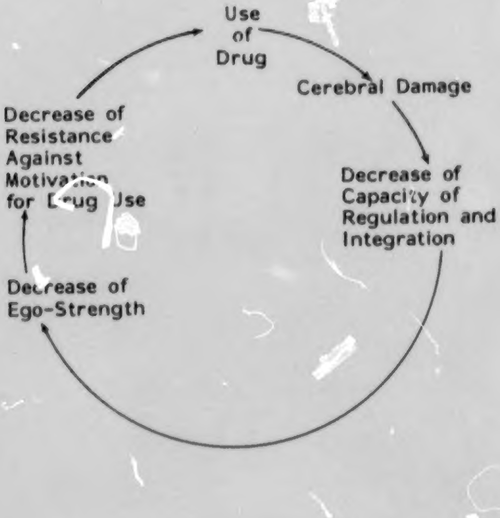

Use of Drug
Metabolic Changes (i.e., Tolerance, Withdrawal Syndrome)
Increase of need

FIGURE 5.—*Cerebro-ego-weakening vicious circle*


Use of Drug
Cerebral Damage
Decrease of Capacity of Regulation and Integration
Decrease of Ego-Strength
Decrease of Resistance Against Motivation for Drug Use

the controlling and synthetic functions of the ego. Describing this process in psychoanalytical terms, we may ascertain a shift from the reality principle to the pleasure-unpleasure principle and an increasing relative predominance of the primary over the secondary process. Since cause and effect influence each other to and fro, we may assess again a vicious circle in the psychic level. (See figure 6.)

Social Vicious Circle

This circular process is based on the fact that drug addiction has social consequences, which in their turn reinforce the use of the drug. The social sequelae may be described as dysfunction, and, finally, a disintegration within the groups the addict is (or was) functioning in. This process has harmful effects on the addict. We may only mention the reproaches of the spouse and other members of the family, the quarrels, the disdain and withdrawal of friends and acquaintances, the tensions and conflicts in the occupational sphere, and, finally, the dropping out from society. This isolation and rejection engender in the subject negative feelings, which foster an attitude of letting oneself go into the state of being an addict. This means a fixation of the role behavior that goes with it and a reinforcement of the identification with a drug-using subculture. As an instance of the latter we may point to the fact that severe penal measures against marijuana users may tip the balance and change an unstable and risky situation into a fixed harmful one.

The social vicious circle is illustrated in figure 7.

General Remarks

After this brief discussion of the principle of the four vicious circles, some general remarks may be added.

1. In some drugs, e.g., alcohol, all vicious circles mentioned are present, whereas, in others, they are not. In marijuana, for instance, the pharmacological and the cerebral circuits are lacking, as far as we can see at present.

2. The original pharmacological, cerebral, psychological, and social factors which give rise to the vicious circles are by no means restricted to the state of addiction only. They may already be demonstrated in the earlier stages of the process of drug use. What we can see, however, is that the more the process moves to the stage of excessive use, the more the generating factors are becoming circular. This shift from a linear to a circular mechanism is connected with a developing disequilibrium between the operating factor on the one hand, and the capacity to keep up with this operating factor or its effects on the other.

   Finally, when a shift has taken place from linear to circular and when the quantitative influence of the circuits has risen to a critical level, the addictive state has been attained and will be maintained.

3. In this progress from more linear to more circular action the factors mentioned do not work separately. In earlier stages they may either cooperate and intensify or, conversely, counterbalance and reduce one another. In the later phases they mostly reinforce

FIGURE 6.—*Psychic vicious circle*

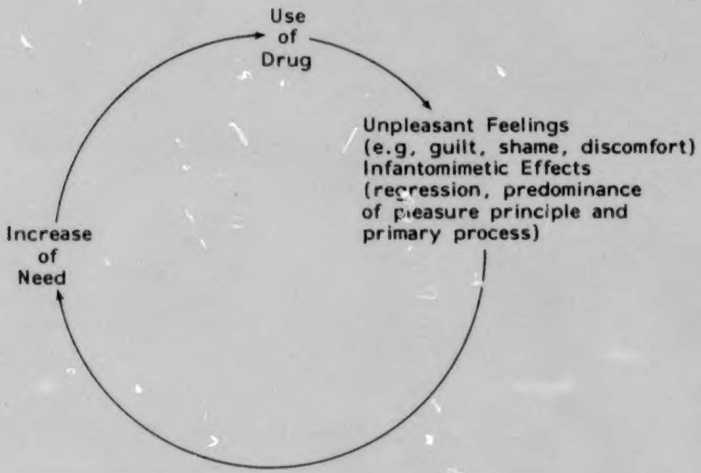
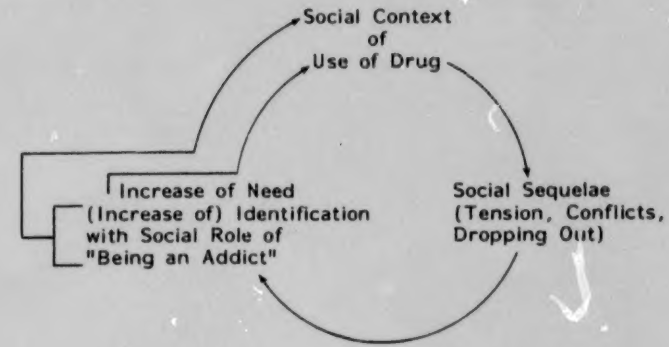

Use of Drug
Unpleasant Feelings (e.g, guilt, shame, discomfort) Infantomimetic Effects (regression, predominance of pleasure principle and primary process)
Increase of Need

FIGURE 7.—*Social vicious circle*


Social Context of Use of Drug
Social Sequelae (Tension, Conflicts, Dropping Out)
Increase of Need
(Increase of) Identification with Social Role of "Being an Addict"

one another, which explains the relative autonomy and the self-perpetuating nature of addiction.

4. An example of the fact that the factors involved may counterbalance each other may be found in the therapeutic field. It is often possible in the process of treatment to switch over a heroin addict to methadone and to keep the patient on a stable dose of it by supportive psychic and social measures. In some cases, the patients themselves try to decrease their dosage, whereas in a nonmedical setting methadone gives rise to addiction with increasing doses in most cases. Here we see that the social and personal factors are able to reduce the pharmacological vicious circle.

A Theory of Opioid Dependence

Abraham Wikler, M.D.

Psychoanalytical theories of addiction virtually ignored the specific pharmacological actions of the drug of addiction but stressed the importance of alleged intrapsychic "impulses" and "archaic longings." Thus, Rado (1933) stated, ". . . not the toxic agent, but the impulse to use it, makes an addict out of a given individual." Fenichel (1945) wrote, ". . . the origin and nature of addiction are not determined by the chemical effect of the drug but by the psychological structure of the patient." Be this as it may, the author is not aware of any data on the results of psychoanalytical therapy in the treatment of addicts; indeed, apart from the prohibitive cost of such therapy, it would seem that in view of the prevalence of psychopathy (sociopathy) and thinking disorder among detoxified opioid addicts (Hill et al. 1960; Monroe et al. 1971), psychoanalytical therapy would be futile. Furthermore, the fact that rats and monkeys, equipped with intravenous cannulas for self-injection, will readily take and maintain themselves on morphine, amphetamines, cocaine, and pentobarbital (Schuster and Thompson 1969) casts some doubt on the necessity of such psychoanalytical variables for the genesis of addiction.

Regardless of theoretical speculations about the role of personality, most writers have agreed that it is the "euphoria" produced by morphine that impels the user to repeat the experience and to relapse after long periods of abstention, for whatever reason. "Euphoria" is defined by McAuliffe and Gordon (1974) as "a subjectively pleasurable feeling produced by taking an opiate drug," and may be assigned a numerical rating on the Hill-Haertzen MBG scale (feeling happy, clear-headed, less discouraged, full of energy, etc.--cited by Jasinski [1973]). However, on the basis of interviews of 60 to 70 opioid addicts, Lindesmith

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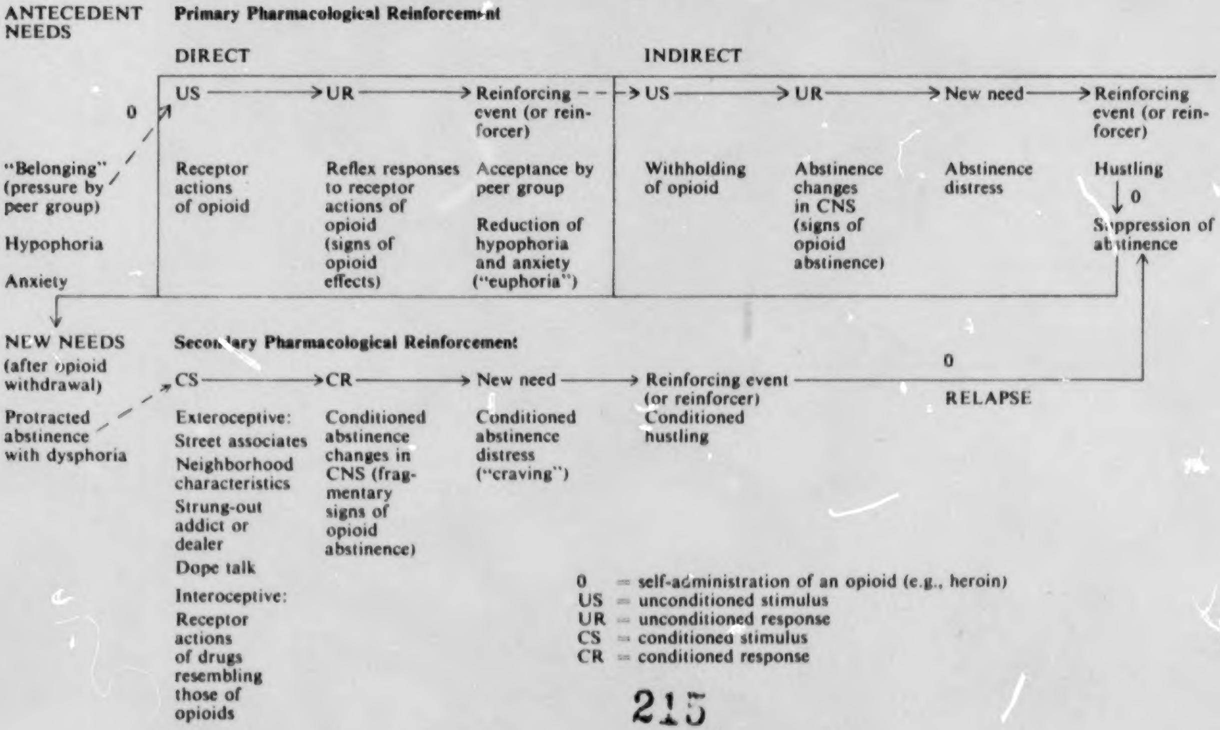
This paper is reprinted with permission from Dr. Wikler's "Opioid Antagonists and Deconditioning in Addiction Treatment," in Drug Dependence--Treatment and Treatment Evaluation, Skandia International Symposia, eds. H. Bostrom, T. Larsson, and N. Ljungstedt (Stockholm: Almqvist & Wiksell International, 1975), pp. 157-182.

(1947) contended that "euphoria" disappears once the subject has become physically dependent, and that the user becomes an addict, and regards himself as such, when he makes a cognitive connection between administration of the drug and relief of withdrawal distress. This has been contested recently by McAuliffe and Gordon (1974), who reported that 98 percent of 64 opioid addicts stated they experienced "euphoria" (initial "rush," followed by "on the nod") after each self-injection of opioid drug (usually heroin) despite long-continued daily use, and claim they have demonstrated that "despite the development of tolerance *chronic opioid addicts do experience euphoria following injections*, and that their desire for euphoria appears to be a major factor in the explanation of their behavior." (Presumably, "behavior" includes relapse.) It may be questioned just how tolerant (and physically dependent) McAuliffe and Gordon's subjects were, since the amounts of drug they took were estimated in street terms and dependence was judged merely by asking other addicts about the individual, looking for extensive old and new scarring ("needle tracks") and asking the addicts themselves. Furthermore, Wikler (1952) observed that there was often a wide discrepancy between subjective reports made by an addict and his objective behavior. Thus, after intravenous injection of 30 mg of morphine, the subject reported he was full of "pep," then went "on the nod" and had to be aroused to explain what he meant by "pep." After several days on multiple, escalating doses of morphine (given on demand), reports of "pep" decreased markedly (though the "thrill" or "rush" persisted) and the subject became increasingly dysphoric (guilt, hostility). Although the subject was at liberty to discontinue taking morphine at any time (with appropriate treatment to minimize withdrawal distress) he continued to escalate the dose and frequency of injections and developed a high degree of tolerance and physical dependence. Wikler (1952) concluded that with the development of physical dependence, a new, pharmacological need was acquired, the gratification of which (by injection of morphine) served to maintain addiction despite the waning of initial "euphoria." It should be noted that this need is *appetitive* (gratification of it is accomplished by getting more and more of the reinforcer, morphine), not *aversive* (gratification of it is accomplished by getting less and less of the reinforcer, e.g., electric shock). Dysphoria (hypochondriasis) in opioid-tolerant and physically dependent subjects has also been observed by Haertzen and Hooks (1969) and by Martin et al. (1973). In an experimental study on six ex-addicts involving a ten-day period of self-injection of heroin (earned by operating a counter), Mirin et al. (1976) observed that initially increased scores on "elated mood" as well as decreased scores on "anxiety" and "somatic concern" tended to return to baseline with continued self-administration of heroin, while concomitantly, belligerence and negativism increased over baseline. Babor et al. (1976) found that the patients showed a tendency to express more hostility after higher doses of heroin. It appears, therefore, that the commonsense interpretation of relapse, namely the quest for "euphoria," is open to question.

In 1948, Wikler proposed that in man relapse is due to evocation by drug-related environmental stimuli ("bad associates," neighborhoods where opioids are illegally available) of fragments of the opioid-abstinence syndrome that had become classically conditioned to such stimuli during previous episodes of addiction. As elaborated further over the years (Wikler 1961, 1965, 1973a,b,c) and presented in figure 1, this hypothesis may be stated as follows. Reinforcement of opioid self-administration and of physiological events immediately preceding such self-administration is contingent upon the prior existence of

FIGURE 1.—***Conditioned theory of addiction and relapse***


ANTECEDENT NEEDS
Primary Pharmacological Reinforcement
DIRECT
INDIRECT
0
US
UR
Reinforcing event (or reinforcer)
US
UR
New need
Reinforcing event (or reinforcer)
"Belonging" (pressure by peer group)
Hypophoria
Anxiety
Receptor actions of opioid
Reflex responses to receptor actions of opioid (signs of opioid effects)
Acceptance by peer group
Reduction of hypophoria and anxiety ("euphoria")
Withholding of opioid
Abstinence changes in CNS (signs of opioid abstinence)
Abstinence distress
Hustling
0
Suppression of abstinence
NEW NEEDS (after opioid withdrawal)
Protracted abstinence with dysphoria
Secondary Pharmacological Reinforcement
CS
CR
New need
Reinforcing event (or reinforcer)
0
RELAPSE
Exteroceptive:
Street associates
Neighborhood characteristics
Strung-out addict or dealer
Dope talk
Interoceptive:
Receptor actions of drugs resembling those of opioids
Conditioned abstinence changes in CNS (fragmentary signs of opioid abstinence)
Conditioned abstinence distress ("craving")
Conditioned hustling

0 = self-administration of an opioid (e.g., heroin)
US = unconditioned stimulus
UR = unconditioned response
CS = conditioned stimulus
CR = conditioned response

"needs" (or "sources of reinforcement") which are reduced by the pharmacological effects of the drug (e.g., heroin). The processes of addiction and relapse may be divided into two successive phases, namely, "primary" and "secondary" pharmacological reinforcement. In the cases of young persons with prevailing moods of hypophoria and anxiety and with strong needs to belong to some identifiable group, self-administration of heroin is often practiced in response to the pressure of a heroin-using peer group in a social environment in which such a peer group exists. In primary pharmacological reinforcement, the pharmacological effects of heroin (miosis, respiratory depression, analgesia, etc.) are conceived as reflex responses to the receptor actions of the drug, but its "direct" reinforcing properties are ascribed to acceptance by the peer groups and reduction of hypophoria and anxiety.

With repetition of self-administration of heroin, tolerance develops rapidly to the direct pharmacological effects of the drug and physical dependence begins (demonstrable by administration of narcotic antagonists after only a few doses of morphine, heroin, or methadone; see Wikler et al. 1953). The prevailing mood of the heroin user is now predominantly dysphoric, and withholding of heroin now has as its reflex consequence the appearance of signs of heroin abstinence (mydriasis, hyperpnea, hyperalgesia, etc.), which generate a new need, experienced as abstinence distress. Because of previous reinforcement of heroin self-administration, the heroin user engaged in "hustling" for opioids--i.e., seeking "connections," earning or stealing money, attempting to outwit the law--which eventually becomes self-reinforcing, though initially at least, it is maintained by acquiring heroin for self-administration. In this stage, the "indirect" reinforcing properties of heroin are attributed to its efficacy in suppressing abstinence distress. "On the street," the heroin user who is both tolerant and physically dependent frequently undergoes abstinence phenomena before he is able to obtain and self-administer the next dose. Given certain more or less constant exteroceptive stimuli (street associates, neighborhood characteristics, "strung out" addicts or leaders, "dope" talk) that are temporally contiguous with such episodes, the cycle of heroin abstinence and its termination can become classically conditioned to such stimuli, while heroin-seeking behavior is operantly conditioned. Sooner or later, the heroin user is detoxified, either in a hospital or in a jail.

The well-known "acute" heroin-abstinence syndrome which is of relatively short duration (about two to four weeks) is followed by the "protracted" abstinence syndrome which, in the case of morphine addiction, has been found to last about 30 weeks (Martin 1972). At least during this period, the detoxified heroin user may be said to have still another new need. If, then, he is returned to his home environment, he is exposed to the phase of secondary pharmacological reinforcement. In response to the conditioned exteroceptive stimuli already described, he may exhibit transient conditioned abstinence changes, experienced as yet another new need, namely "narcotic hunger" or "craving." Previously reinforced "hustling" is also likely to appear now as a conditioned response (self-reinforcing) to these same exteroceptive stimuli and lead to acquisition and self-administration of heroin. The reinforcing properties of heroin, ascribed to its efficacy in suppressing conditioned abstinence distress, generate further self-adminstration of the drug with reestablishment of physical dependence as in the "indirect" stage of primary pharmacological reinforcement, and the cycle of renewed conditioning, detoxification, and secondary pharmacological reinforcement with relapse is repeated again. Also, in the phase of primary pharmacological reinforcement, certain of the interoceptive actions of opioids, not involved in the suppression of abstinence phenomena, can acquire conditioned properties, inasmuch as in a tolerant and physically dependent individual, they are often followed by abstinence phenomena before termination of the latter by the next dose. Hence, in the phase of secondary pharmacological reinforcement, the usual effects of an opioid, administered for whatever reason, may be followed by conditioned abstinence phenomena, conditioned abstinence distress, and conditioned hustling leading to self-administration of heroin (relapse). Other interoceptive events can likewise acquire the property of evoking conditioned self-administration of opioids. For example, anxiety is frequently associated with the opioid-abstinence syndrome, and probably the two phenomena are mediated, in part, by the same central nervous system pathways. Hence, the occurrence of anxiety for whatever reason long after detoxification may result in relapse.

If it is accepted that conditioning factors (classical and operant) and protracted abstinence play an important role in relapse, then addiction must be regarded as a disease sui generis, and regardless of antecedent etiological variables (e.g., premorbid personality), its specific features must be eliminated by appropriate procedures. As Wikler (1965) pointed out, mere detoxification, with or without conventional psychotherapy and enforced abstention from self-administration of opioids, will not prevent relapse when the former addict returns to his home environment or other environments where the conditioned stimuli are present (drugs readily available; "pushers" and active addicts). What is needed in treatment after "detoxification" is active extinction of both classically conditioned abstinence and operantly conditioned opioid self-administration. This would require repeated elicitation of conditioned abstinence and repeated self-administration of opioids under conditions that prevent the reinforcing effects of opioids (production of "euphoria," reestablishment of physical dependence). Under such conditions, conditioned abstinence should eventually disappear and self-administration of opioids should eventually cease. With the introduction of the orally effective, long-acting opioid antagonist, cyclazocine, by Martin et al. (1966), it became possible to prevent the reinforcing effects of opioids by daily administration of cyclazocine. If former addicts are maintained on blocking doses of an antagonist for a sufficient length of time (e.g., over 30 weeks) to permit disappearance of protracted abstinence, and if active extinction procedures are carried out during this period (Wikler 1973d), then administration of the antagonist may be discontinued, with the expectation that relapse will be much less likely to recur.

THEORIES ON

One's Relationship to Society

The Social Bases of Drug-Induced Experiences

Howard S. Becker, Ph.D.

Scientists no longer believe that a drug has a simple physiological action, essentially the same in all humans. Experimental, anthropological, and sociological evidence has convinced most observers that drug effects vary greatly, depending on the physiology and psychology of the persons taking them, on their state when they ingest the drug, and on the social situation. We can understand the social context of drug experiences better by showing how the nature of the experience depends on the amount and kind of knowledge available to the person taking the drug. Since distribution is a function of the social organization of the groups in which drugs are used, drug experiences differ with differences in social organization. This paper will focus primarily on the illegal use of drugs for pleasure--and especially the use of LSD and marijuana--but will also discuss the use of medically prescribed drugs by patients, and the involuntary ingestion of drugs by victims of chemical warfare.[2]

Drug effects vary from person to person and place to place because they almost always have more than one effect. People may conventionally focus on and recognize only one or a few of these effects, ignoring the others as irrelevant. For example, most people think the effect of aspirin is to control pain; some know that it also reduces fever; few think of gastric irritation as a typical effect, although it is. Thus

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[1] This paper, prepared by Jean B. Wilson and reviewed by Howard S. Becker, consists of material taken from two previously published articles written by Dr. Becker. (1) "Consciousness, Power and Drug Effects," Journal of Psychedelic Drugs 6(1974):67-76. Reprinted with permission of STASH, Inc. Copyright © 1974. (2) "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences," Journal of Health and Social Behavior 8(1967):163-176. Reprinted with permission of the American Sociological Association.

[2] Material in this paragraph was taken from "Consciousness, Power and Drug Effects," p. 67. See footnote 1.

users are likely to focus on the "beneficial" effects they seek and to ignore others.[2]

DRUG EFFECTS, KNOWLEDGE, AND SOCIAL STRUCTURE

When people take drugs, their subsequent experience is likely to be influenced by their ideas and beliefs about the drug (Becker 1967). What they know about the drug influences the way they use it, the way they interpret its manifold effects and respond to them, and the way they deal with the aftereffects. Conversely, what they do not know also affects their experience, making both certain interpretations and action, based on that missing knowledge, impossible. (I use "knowledge" to refer to any ideas or beliefs about a drug that anyone concerned in its use, e.g., illicit drug sellers, physicians, researchers, or lay drug users, believes to have been tested against experience and thus to carry more weight than mere assertions of faith.)[2]

DOSAGE

Many drug effects are dose related. The drug has one set of effects if you take X amount and quite different if you take 5X. Similarly, the effects vary depending on the means of taking a drug. How much of a drug you take and how you take it depend on what you have learned from sources you consider knowledgeable and trustworthy.[3]

Most people know, for instance, that the usual dose of aspirin tablets is two and that they should be swallowed. On the other hand, few people have readily available knowledge about the vast majority of drugs prescribed by doctors or about those illicitly obtained, such as LSD. Persons planning to take a drug (for whatever reason) either resort to trial-and-error experimentation or rely on sources they consider reliable (scientists, physicians, or more experienced drug users). These sources can usually tell the prospective user how much to take and how to take it to achieve whatever the desired effect may be (to control blood clotting time, to get high, or whatever).[3]

With the understanding thus acquired, users take an amount whose effect they can more or less accurately predict. They usually find this prediction confirmed, though the accuracy of conventional knowledge needs to be known. In this way, their access to knowledge exerts a direct influence on their experience, allowing them to control the physiological input to that experience.[3]

This analysis supposes that users have complete control over the amount they take. This is not always true, since a user may wish to take more than the physician will prescribe or a pharmacist sell. On the other hand, doctors ordinarily prescribe and pharmacists sell amounts larger than recommended for one-time use, so that users can take more than they are "supposed to." They can also purchase drugs illicitly or "semilicitly" (e.g., from a friendly neighborhood pharmacist).[3]

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[2] Material in these paragraphs was taken from "Consciousness, Power and Drug Effects," p. 67. See footnote 1.

[3] Material in these paragraphs was taken from "Consciousness, Power and Drug Effects," pp. 67-68. See footnote 1.

MAIN EFFECTS

Social scientists have shown how the definitions drug users apply to their experience affect that experience. Persons suffering opiate withdrawal will respond as "typical" addicts if they interpret their distress as opiate withdrawal, but not if they blame the pain on some other cause (e.g., recovery from surgery). Marijuana users must learn to interpret its subtle effect as being different from ordinary experience and as pleasurable before they "get high" (Becker 1953). Native Americans and Caucasians interpret peyote experiences differently (Aberle 1966), and LSD trips have been experienced as consciousness expansion, transcendental religious experience, mock psychosis, or being high (Blum and Associates 1964). In short, users bring to bear, in interpreting their experience, knowledge and definitions derived from participation in particular social groups.[4]

SIDE EFFECTS

Side effects are not a medically or pharmacologically distinct category of reactions to drugs. Rather, they are effects not desired either by the user or the person administering the drug. Both side effects and main effects are thus socially defined categories. Mental disorientation might be an unwanted side effect to a physician but a desired main effect for an illicit drug user.[4]

A drug user's knowledge, if adequate, lets him or her identify unwanted side effects and deal with them in a self-satisfactory way. Users concentrating on a desired main effect may not observe an unpleasant side effect or may not connect it with use of the drug. They interpret their experience most adequately if those who prepare them for the drug's main effects likewise teach them the likely side effects and how to deal with them. Illicit drug users typically teach novices the side effects to look out for, give reassurance about their seriousness, and give instructions in how to avoid or overcome them.[5]

LSD

The peculiar effects that lysergic acid diethylamide (LSD-25) has on the mind were discovered in 1938 by Albert Hoffman, who synthesized the drug in 1943. Following World War II, it came into use in psychiatry, both as a method of simulating psychosis for clinical study and as a means of therapy (Unger 1966), and has been the subject of controversy ever since. At one extreme, Timothy Leary considers its use so beneficial that he has founded a new religion in which it is the major sacrament. At the other extreme, psychiatrists, police, and journalists allege that LSD is extremely dangerous, that it produces psychosis, and that persons under its influence are likely to commit acts dangerous to themselves and others that they would not otherwise commit.

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[3] Material in this paragraph was taken from "Consciousness, Power and Drug Effects," pp. 67-68. See footnote 1.

[4] Material in these paragraphs was taken from "Consciousness, Power and Drug Effects," pp. 68-69. See footnote 1.

[5] Material in this paragraph was taken from "Consciousness, Power and Drug Effects," p. 69. See footnote 1.

In spite of the great interest in the drug, I think it is fair to say that the evidence of its danger is by no means decisive (Cohen 1960; Cohen and Ditman 1962, 1963; Frosch et al. 1965; Hoffer 1965; Rosenthal 1964; Ungerleider et al. 1966). If the drug does prove to be the cause of a bona fide psychosis, it will be the only case in which anyone can state with authority that they have found the unique cause of any such phenomenon.

But if we refuse to accept the explanations of others, we are obligated to provide one of our own. In what follows, I will consider the reports of LSD-induced psychoses and try to relate them to what is known of the social psychology and sociology of drug use. By keeping in mind what is known of the influence that knowledge and social orientation have on the effects--both main effects and side effects--that a drug user experiences, I hope to add both to our understanding of the current controversy over LSD and to our general knowledge of the social character of drug use. In particular, I will make use of a comparison between LSD use and marijuana use. The early history of marijuana use contains the same reports of "psychotic episodes" now current with respect to LSD. But reports of such episodes disappeared at the same time as the number of marijuana users increased greatly.

I must add a cautionary disclaimer. I have not exhaustively examined the literature on LSD. What I have to say about it is necessarily speculative with respect to its effects: what I have to say about the conditions under which it is used is also speculative, but is based in part on interviews with a few users.

The physiological effects of drugs can be ascertained by standard techniques of physiological and pharmacological research. In contrast, the subjective changes produced by a drug can be ascertained only by asking the subject how he or she feels. People who take drugs for recreational purposes do so because they wish to experience just those subjective effects which they would either ignore or define as noxious side effects if they were taking a drug for medicinal reasons. And because the use of drugs to induce a change in consciousness seems to many immoral, drug users come to the attention of sociologists as lawbreakers.

Nevertheless, some sociologists, anthropologists, and social psychologists have investigated the problem of drug-induced subjective experience in its own right. Taking their findings together the following conclusions seem justified (Becker 1963; Blum and Associates 1964;*

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*Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

Lindesmith 1947; Metzner et al. 1965; Aberle 1966; Schachter and Singer 1962; Nowlis and Nowlis 1956). (1) Many drugs, including those used to produce changes in subjective experience, have a great variety of effects, and the user may be unaware of some of them, or may not recognize them as attributable to use of the drug. (2) The effects of the same drug may be experienced differently by different people or by the same people at different times. (3) Since recreational users take drugs in order to achieve some subjective state not ordinarily available to them, they expect and are most likely to experience those effects which are different from ordinary patterns. Thus, distortions in perception of time and space and shifts in judgment of the importance and meaning of ordinary events are the most commonly reported effects. (4) Any of a great variety of effects may be singled out by the user as desirable or pleasurable. Even effects which seem to the uninitiated to be uncomfortable, unpleasant, or frightening--perceptual distortions or visual and auditory hallucinations--can be defined by users as a goal to be sought (Becker 1963). (5) How people experience the effects of a drug depends greatly on the way others define those effects for them (Becker 1963; Blum and Associates 1964; Lindesmith 1947; Metzner et al. 1965; Aberle 1966; Schachter and Singer 1962; Nowlis and Nowlis 1956). If others whom users believe to be knowledgeable single out certain effects as characteristic and dismiss others, they are likely to notice those same effects as characteristic of their own experience. If certain effects are defined as transitory, users are apt to believe that those effects will go away.

The scientific literature and, even more, the popular press frequently state that recreational drug use produces a psychosis. What writers seem to mean by "psychosis" is a mental disturbance of some unspecified kind, involving hallucinations, an inability to control one's stream of thought, and a tendency to engage in socially inappropriate behavior In addition, and perhaps most important, psychosis is thought to be a state that will last long beyond the specific event that provoked it.

Verified reports of drug-induced psychoses are scarcer than one might think (Cohen 1960; Cohen and Ditman 1962, 1963; Frosch et al. 1965; Hoffer 1965; Rosenthal 1964; Ungerleider et al. 1966; Bromberg 1939; Curtis 1939; Nesbitt 1940). Nevertheless, let us assume that these reports represent an interpretation of something that really happened. What kind of event can we imagine to have occurred that might have been interpreted as a "psychotic episode"?

The most likely sequence of events is this. An inexperienced user has certain unusual subjective experiences, which he or she may or may not attribute to having taken the drug, such as a distorted perception of space, so that it is difficult to climb stairs. The user's train of thought may be so confused that it is impossible to carry on a normal conversation. The user may suspect that the way he or she sees or hears things is quite different from the way others see and hear them.

Whether or not the user attributes what is happening to the drug, the experiences are apt to be upsetting. One of the ways we know that we are normal human beings is that our perceptual world seems to be* pretty much the same as other people's. If this is no longer true--if we find our subjective state so altered that our perceptions are no longer like other people's, we may think we have become insane. This is precisely what may happen to the inexperienced drug user. Moreover, this interpretation implies that the change is irreversible or, at least, that normality is not going to be restored easily. The drug experience, perhaps originally intended as a momentary entertainment, now looms as a momentous event which will disrupt one's life, possibly permanently. Faced with this conclusion, the user develops a full-blown anxiety attack, but it is an attack caused by the reaction to the drug experience rather than a direct consequence of the drug itself. (It is interesting that, in published reports of LSD psychoses, acute anxiety attacks appear as the largest category of untoward reactions [Frosch et al. 1965; Cohen and Ditman 1963; Ungerleider et al. 1966; Bromberg 1939].) Of course, long-time users may have similar experiences if they take a higher dosage than they are used to or because illicitly purchased drugs may vary greatly in strength.

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*Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

The scientific literature does not report any verified cases of people acting on their distorted perceptions so as to harm themselves or others, but such cases have been reported in the press. If users have, for instance, stepped out of a second story window, deluded into thinking it only a few feet to the ground (Cohen 1960; Hoffer 1965), it would be because they had failed to make the necessary correction for the drug-induced distortion rather than because of an anxiety attack. Experienced users assert, however, that such corrections can be made and that they can control their thinking and actions so as to behave appropriately (Becker 1963).

Thus the most likely interpretation we can make of the drug-induced psychoses reported is that they are either severe anxiety reactions to an event interpreted and experienced as insanity, or failures of the user to correct for the perceptual distortions caused by the drug.

While there are no reliable figures, it is obvious that a very large number of people use recreational drugs, primarily marijuana and LSD. One might suppose, then, that a great many people would have disquieting symptoms and that many would decide they had gone crazy and thus have a drug-induced anxiety attack. But while there must be more such occurrences than are reported in the professional literature, it is unlikely that there are any large number. Since the psychotic reaction stems from a definition of the drug-induced experience, the explanation of this paradox must lie in the availability of competing definitions of the subjective states produced by drugs.

Competing definitions come to users from other users who are known to have had sufficient experience with the drug to speak with authority. New users know that the drug does not produce permanent disabling damage in all cases, for they can see that other users do not suffer from it. The question remains, of course, whether the drug may not produce damage in some cases, however rare, and whether a particular person may be one of those cases.*

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*Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

When users experience disturbing effects, other users typically assure them that the change in their subjective experience is neither rare nor dangerous. They may, for instance, know of an antidote for the frightening effects. They talk reassuringly about their own experiences, "normalizing" the frightening symptom by treating it as temporary. They maintain surveillance over affected users, preventing any physically or socially dangerous activity. They show them how to allow for the perceptual distortion the drug causes and how to manage interaction with nonusers. They redefine the experience the novice is having as desirable rather than frightening, as the end for which the drug is taken (New York City Mayor's Committee on Marihuana 1944; Becker 1963). What they say carries conviction, because the novice can see that it is not some idiosyncratic belief but is instead culturally shared. He or she thus has an alternative to defining the experience as "going crazy," and may decide that it was not so bad after all.

We do not know how often this mechanism comes into play or how effective it is in preventing untoward psychological reactions. However, in the case of marijuana, at least, the paucity of reported cases of permanent damage coupled with the undoubted increase in use suggests that it may be effective.

For such a mechanism to operate, a number of conditions must be met. First, the drug must not produce permanent damage to the mind. Second, users of the drug must share a set of understandings--a culture--which includes, in addition to material on how to obtain and ingest the drug, definitions of the typical effects, the typical course of the experience, the impermanence of the effects, and a description of methods for dealing with someone who suffers an anxiety attack because of drug use or attempts to act on the basis of distorted perceptions.

Third, the drug should ordinarily be used in group settings, where other users can present the definitions of the drug-using culture to the person whose inner experience is so unusual as to provoke use of the commonsense category of insanity. Drugs for which technology and custom produce group use should produce a lower incidence of "psychotic episodes."

The last two conditions suggest, as is the case, that marijuana, surrounded by an elaborate culture and ordinarily used in group settings, should produce few psychotic episodes. I will discuss evidence on this point later.

Users suffering from drug-induced anxiety may also come into contact with nonusers who will offer definitions, depending on their own perspective and experience, that may validate the diagnosis of "going crazy" and thus prolong the episode, possibly producing relatively permanent disability. These nonusers include family members and police, but most important among them are psychiatrists and psychiatrically oriented physicians.*

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*Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

Medical knowledge about the recreational use of drugs is spotty. Little research has been done or--as in the case of LSD--its conclusions are not clear, and what is known is not at the fingertips of physicians who do not specialize in the area. Psychiatrists are not anxious to treat drug users, so few of them have accumulated any clinical experience with the phenomenon. Nevertheless, a user who develops severe and uncontrollable anxiety will probably be brought to a psychiatric hospital, to an emergency room where a psychiatric resident will be called, or to a private psychiatrist (Ungerleider et al. 1966).

Physicians, confronted with a case of drug-induced anxiety and lacking specific knowledge of its character or proper treatment, rely on a kind of generalized diagnosis. They reason that people probably do not use drugs unless they are suffering from a severe underlying personality disturbance; that use of the drug may allow repressed conflicts to come into the open where they will prove unmanageable; that the drug in this way provokes a true psychosis; and, therefore, that the patient confronting them is psychotic. Furthermore, even though the effects of the drug wear off, the psychosis may not, for the repressed psychological problems it has brought to the surface may not recede.

On the basis of such a diagnosis, the physician hospitalizes the patient for observation and prepares, where possible, for long-term therapy designed to repair the damage done to the psychic defenses or to deal with the conflict. Both hospitalization and therapy are likely to reinforce the definition of the drug experience as insanity, for in both the patient will be required to "understand" that he or she is mentally ill as a precondition for return to the world (Szasz 1961).

Physicians, then, do not treat the anxiety attack as a localized phenomenon, to be treated in a symptomatic way, but as an outbreak of a serious disease heretofore hidden. They may thus prolong the serious effects beyond the time they might have lasted had the user instead come into contact with other users. This analysis, of course, is frankly speculative; what is required is more study of the way physicians treat cases of the kind described and, especially, comparative studies of the effects of treatment of drug-induced anxiety attacks by physicians and by drug users.

A number of variables, then, affect the character of drug-induced experiences. It remains to show that the experiences themselves are apt to vary according to when they occur in the history of use of a given drug in a society. In particular, it seems likely that the experience of acute anxiety caused by drug use will so vary.

Let us suppose that someone in a society discovers, rediscovers, or invents a drug which has the ability to alter subjective experience in desirable ways. This becomes known to increasing numbers of people, and the drug itself simultaneously becomes available, along with the information needed to make its use effective. Use increases, but users do not have a sufficient amount of experience with the drug to form a stable conception of it. No drug-using culture exists, and there is thus no authoritative alternative with which to counter the possible[*]

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[*] Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

definition, when and if it comes to mind, of the drug experience as madness. "Psychotic episodes" occur frequently.

But individuals accumulate experience with the drug and communicate their experiences to one another. Consensus develops about the drug's subjective effects, their duration, proper dosages, predictable dangers and how they may be avoided. All these points become matters of common knowledge, available to the novice user as well as the experienced one. A culture exists. "Psychotic episodes" occur less frequently in proportion to the growth of the culture.

Is this model a useful guide to reality? The only drug for which there is sufficient evidence to attempt an evaluation is marijuana. Even there the evidence is equivocal, but it is consistent with the model.

Marijuana first came into use in the United States in the 1920s and early 30s, and all reports of psychosis associated with its use date from approximately that period (Bromberg 1939; Curtis 1939; Nesbitt 1940)--before there was a fully formed drug-using culture. The subsequent disappearance of reports of psychosis thus fits the model. It is, of course, a shaky index, for it depends as much on the reporting habits of physicians as on the true incidence of cases, but it is the only thing available.

The psychoses described also fit the model, insofar as there is any clear indication of a drug-induced effect. The best evidence comes from the 31 cases reported by Bromberg. Where the detail given allows judgment, it appears that all but one stemmed from the person's inability to deal with either the perceptual distortion caused by the drug or with the panic created by the thought of losing one's mind (Bromberg 1939, pp. 6-7).

The evidence cited is extremely scanty, which leaves the final question, then, whether the model can be used to interpret current reports of LSD-induced psychosis. Are these episodes the consequence of an early stage in the development of an LSD-using culture? Will the number of episodes decrease while the number of users rises, as the model leads us to predict?

We cannot predict the history of LSD by direct analogy to the history of marijuana, for a number of important conditions may vary, and evidence on a number of important factors is still highly inconclusive. For example, there is a great deal of controversy as to whether or not LSD has any demonstrated causal relation to psychosis, apart from the definitions users impose on their experience. My own opinion is that while LSD may be more powerful in its effects than other drugs that have been studied, the cases in the literature support the belief that most of the psychotic episodes are panic reactions to the drug experience occasioned by the users' belief that they have lost their minds, or further disturbances among people already quite disturbed.

Is there an LSD-using culture? Here again, discussion must be tentative. It appears likely, however, that such a culture is in an early* stage of development, and that users who are part of that culture are helped to cope with their experiences. For example, the notion that a "bad trip" can be brought to a speedy conclusion by taking Thorazine has spread. Knowledge of other safeguards is also becoming more widely known. Insofar as this emergent culture spreads so that most or all users share the belief that LSD does not cause insanity, the knowledge about dosage, effects, and so on, as well as the incidence of "psychoses" should drop markedly or disappear.[6]

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*Material on this page was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

On the other hand, the ease with which LSD can be taken may negate the helpful influence of an LSD culture. No special paraphernalia is necessary, no special technique. A sugar cube can be swallowed without instruction. Consequently it is possible that many people will take the drug without having acquired the presently developing cultural understanding, that many users will be people with no previous experience of recreational drug use, and that they will take it without the presence of supportive, experienced users. Changing mores about youth use may add to the number of people who take the drug without being indoctrinated in the new cultural definitions, in which case the number of episodes may go up.[6]

We have been talking of drug use in which taking the drug is a matter of choice and in which the desired effect is a subjective one. But people also delegate control of their drug use to others, most commonly to physicians. When people take drugs prescribed to them by doctors, they do not rely on trial and error or a drug culture for knowledge concerning dosage, main effects, and side effects, but usually on the doctor. While the doctor wants to alleviate some dangerous condition the patient is suffering from, doctor's and patient's desires do not necessarily coincide. Moreover, the doctor may not give patients sufficient information to anticipate the effects a drug may have, with the result that patients are sometimes unnecessarily frightened or may suffer dangerous reactions without connecting them with the drug. The doctor may not give patients all the information he or she has for fear that the patient will disobey orders (Lennard 1972). Sometimes the doctor does not have adequate information about the experience the drug will produce. In either case, the drug experience is amplified and the chance of serious pathology increases. The patient, not knowing what is likely to happen, cannot recognize the event when it occurs and cannot respond adequately or present the problem to an expert who can provide an adequate response.[7]

CONTROL BY EXTERNAL AGENTS

People sometimes find themselves required to ingest drugs involuntarily. In some instances, the agent administers the drug believing it to be for the good of the patient, as when a doctor gives medicine to a baby, who cannot resist. Or the agent may administer drugs "for the

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[6] Material in these paragraphs was taken from "History, Culture and Subjective Experience: An Exploration of the Social Bases of Drug-Induced Experiences." See footnote 1.

[7] Material in this paragraph was taken from "Consciousness, Power and Drug Effects," pp. 71-72. See footnote 1.

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good of the community," as when people with tuberculosis or leprosy are medicated to prevent them from infecting others (Roth 1963).*

But sometimes the external agent's purposes conflict directly with those of the user, as when people find themselves the victims of chemical warfare. Those who administer drugs to involuntary users are either indifferent about providing recipients with any knowledge about it or actively attempt to prevent them from getting that knowledge. Where destruction or incapacitation of the target population is the aim, the agent may try to conceal the fact that a drug is being administered. In this way, the agent hopes to prevent the taking of countermeasures and, in addition to the drug's specific physiological effects, create panic at the onslaught of the unknown.*

CONCLUSION

If drug experiences somehow reflect or are related to social settings, we must specify the settings in which drugs are taken and the specific effect of those settings on the experiences of the participants. This analysis suggests that it is useful to look at the role of power and knowledge in those settings: knowledge of how to take the drugs and what to expect when one does, and power over their distribution, the acquisition of information about them, and the decision to take or not to take them. The need for further research extends both to the licit and illicit use of drugs, to the danger of taking drugs for recreational purposes (including "prescribed" drugs), into the profit orientation of pharmaceutical manufacturers, and to the sometimes inadequate knowledge and sometimes ambivalent motives of doctors who share or do not share their knowledge with their patients.*

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*Material in these paragraphs was taken from "Consciousness, Power and Drug Effects," pp. 74-75. See footnote 1.

*Material in this paragraph was taken from "Consciousness, Power and Drug Effects," p. 75. See footnote 1.

Drug Abuse as Learned Behavior

Calvin J. Frederick, Ph.D.

Although there are recognized physiological factors involved in hardcore addiction, the sine qua non for drug abuse/addiction is to be found in learning theory. A variety of components, such as cultural environment, availability, exposure to drug use patterns, and self-perceived needs, contribute to the acquisition of a drug habit. The fact that physical relief occurs in the addictive cycle cannot be separated from the psychological aspects which accompany it. The impact of profound relief adds appreciably to the learning process. What was so satisfying during the initial period of tension reduction will be likely to repeat itself under similar circumstances on the next occasion. A learning framework can explain not only drug abuse/addiction but other related behaviors as well. This has been noted previously by the author (1972, 1973), by Frederick and Resnik (1971), and by Frederick et al. (1973).

The learning theory paradigm tends to follow a particular sequence. When an intense stimulus situation remains relatively unchanged, it will inevitably be followed by anxiety, a state which requires diminution. In terms of traditional reinforcement theory, anxiety is a secondary reinforcer, since the attainment of the goal object (drug) possesses its own reinforcing properties. This occurs because, through past experience, drug ingestion has become associated with a primary drive state, such as a physiological need or imbalance. For our purposes here, any stimulus condition which contributes to this drive state is sufficient to support the notion of drug abuse as learned behavior. The response that follows is likely to become progressively more prominent as a specific act which brings results, since it evokes dramatic attention along with a need for drug ingestion. The ensuing tension reduction from the drug brings relief and reinforcement of the act which induced the administration of the drug in the first place. As this process is repeated, the sequence of events is shortened in time because the decrease in tension reduction becomes so powerfully reinforced, and every point in the sequence becomes an associative cue for the ultimate relief. With each reinforcement, the act of substance abuse becomes strengthened, and the likelihood of its recurrence under similar conditions is increased. In cases when the tension is particularly acute, such an act may be learned very quickly. The paradigm looks like

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this: stimulus situation (stress, shame, guilt) → tension (anxiety) → addictive acts (drug seeking/receiving/ingesting) → tension reduction → stimulus situation--and the cycle repeats itself.

Other authors (Wikler 1965, 1973b; Jaffe 1970a; Crowley 1972), have also commented upon the learning components inherent in drug abuse. A description of the theoretical contribution of each of the major elements in this treatise can not only illustrate the theory but can make each of the five elements of drug abuse--initiation of use, continuation, shift or transition from use to abuse, cessation, and relapse--more understandable, especially to the therapist. Drug abuse is expressed as a ratio of destructive factors to constructive factors operating in the personality. These factors are multiplicative functions of each other as they contribute to drug behavior. This may be illustrated as follows:

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} \quad \text{or} \quad Ba = \frac{\text{destructive factors}}{\text{constructive factors}}$$

where

Ba = Drug addiction or abuse

Pd = Personality components that are weak and destructive

Md = Motivation or strength of drive state toward destructive, undesirable behavior

Hd = Habits as a function of the number of reinforcements associated with drug-taking behavior

Rd = Risk-taking stimuli associated with drug ingestion

Pc = Personality components that are strong and constructive

Mc = Motivation or strength of drive state toward constructive, desirable behavior

Hc = Habits as a function of the number of reinforcements associated with favorable responses to stress

Rc = Risk-taking stimuli associated with constructive responses

Let the value of 1.0 be considered the point where drug addiction or abuse will definitely occur; zero represents the value where no likelihood of such behavior obtains. As the proportion moves upward from the equally weighted value of 50 percent (0.50), the probability of drug abuse, thereby, increases as the value of 1.0 is approached. Conversely, the likelihood of drug abuse occurring decreases proportionately as the numerical value approaches zero. Each of the variables listed in the formula will possess its own weights, according to past experience and those influences currently operating in the life of the individual.

Since destructive and constructive factors in drug addiction or abuse may be expressed illustratively as a ratio, strong personality and motivational variables predominate as constructive forces in the denominator, while habits and motivation are equal in both the numerator and denominator. In order to show the learning principles involved, let us assume that there is an equal chance for the growth of destructive and constructive factors which contribute to the development of drug-related behavior. A 50-percent probability represents this situation numerically. This may be shown by substituting arbitrary values for each of the variables in the formula, as follows:

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{2 \times 3 \times 1 \times 5}{3 \times 4 \times 1 \times 5} = \frac{30}{60} = 0.50$$

When the risk-taking aspects of the destructive factors increase even slightly, there is a growth in the likelihood that drug abuse will develop. This will obtain even when other factors remain the same as those in the situation noted above, with a 50-percent probability in the level of occurrence. This change may be demonstrated by increasing the risk factor (Rd) by one point in the formula, since the ratio value now becomes 0.60, which is closer to 1.0 than is 0.50.

$$\frac{2 \times 3 \times 1 \times 6}{3 \times 4 \times 1 \times 5} = \frac{36}{60} = 0.60$$

Conversely, when the constructive aspects of risk are strengthened by one point in the formula, the likelihood of drug abuse developing decreases, inasmuch as the resulting proportion of 0.42 is closer to zero than is 0.50.

$$\frac{2 \times 3 \times 1 \times 5}{3 \times 4 \times 1 \times 6} = \frac{30}{72} = 0.42$$

Obviously, when the other factors in the equation change through reinforcement or nonreinforcement, the ratio changes accordingly. If one or more of the variables is weakened through nonreinforcement, the scales are tipped in either a destructive or constructive direction, depending upon the total value of the proportion. For purposes of simplification, only the risk factor has been varied here to illustrate the importance of a single value in the ratio. Moreover, factors other than those noted may be involved, although these seem to be the most prominent, especially if environmental influences are subsumed under those listed. Risk-taking behavior, in particular, is likely to be responsive to environmental stimuli, for example. The abuser/addict should be aware of the increase in risk-taking behavior as a destructive force since mere geographic placement into an old, familiar environment can often stimulate the recurrence of a previous drug problem. This is due to the strength of past associations as they contribute to old habits of drug use.

Substitute medications, such as methadone, may alter the balance of destructive factors in the behavioral equation by reducing anxiety and a tendency toward depression on a tentative basis. Frederick et al. (1973) report that clinical depression recurs during methadone abstinence, and, hence, the abuser/addict and the therapist should be cognizant of this fact as well as of the temporary palliative effects of drug substitutes like methadone. This must be taken into account in the readjustment process of a therapy program. Substitutes in effective living can be supplied, rather than replacing one drug with another, particularly at a point in treatment when the habit has begun to lose strength. The relearning process affects every facet of the treatment program through the same principles by which abuse/addiction develops and continues.

The strengthening of the addictive act is not merely a direct function of the number of reinforcements. Reinforcement of drug responses on an intermittent basis can lead to greater conditioning and more resistance to extinction than can reinforcement of every response. Anticipation of the receipt of a drug can stimulate further drug-seeking/receiving behavior. In extinguishing the drug response, the intermittent reinforcement principle holds for punishment as well as for reward. Once drug abuse/addiction has begun, it constitutes a punishing state of affairs when the person goes without the drug. Not receiving this strong reinforcer on each anticipated occasion contributes both to the drive to use it and to its suppression and extinction. Going "cold turkey" exemplifies this. The heightened drive state increases the likelihood of the addictive response when the strength of the habit remains constant or is even slightly reduced, depending upon the value of the drive state. Nonreinforcement of the habit, which is tantamount to punishment, causes it to weaken. After the drive reaches its peak, a decrement occurs in the strength of the habit, resulting in a diminution of the addictive response. General reinforcement principles are employed to account for the various facets of the development of drug usage for purposes of clarification, although it is evident that intermittent reward and punishment also operate in concert with the theory as outlined. The entire treatment spectrum, including administration of substituted medications, milieu therapy, and psychotherapy, is governed by these principles, as well.

Psychosocial Theory of Drug Abuse

A Psychodynamic Approach

Herbert Hendin, M.D.

A psychodynamic approach to psychosocial problems seeks to explain the interrelation between social and psychological variables in producing adaptive and maladaptive behavior. It relies on psychodynamic study of a representative number of individuals to assess the meaning of these variables.

Psychosocial theory without a psychodynamic base has increasingly tended to reduce emotional illness to the consequences of such social factors as poverty, sex, and race. Economic determinism, sexism, and racism, however, cannot explain the great variations in the abilities of people to deal with the problems of class, sex, and race. The psychology of a considerable number of any group must be evaluated to understand the actual impact of caste or class on the character and adaptation of the rich or the poor. On the basis of work with Puerto Rican families, Oscar Lewis (1966) gave us an illuminating picture of the "culture of poverty." Yet anyone who works with poor Hispanic, poor white, and poor black families quickly becomes familiar with how different the culture of poverty is in each of these groups, let alone how varied the individual and family response is to the fact of poverty.

In the case of the drug problem, social variables ranging from sexual activity to association with friends who use drugs have been shown to be related to drug use (Kandel 1973; Jessor and Jessor 1975). Friends, sexual activity, and drug use, however, are all part of an individual's total adaptation, and their interrelated significance for this adaptation must be understood in order to establish any meaningful psychosocial perspective.

Psychodynamic investigation employing unstructured interview sessions that rely on free associations, associative linkages, transference reactions, omissions, dreams, and fantasies provides a uniquely sensitive method for establishing individual and family dynamics (Hendin 1964; Hendin et al. 1965). Early psychodynamic studies of drug abuse, however, ignored social and even familial factors and viewed the abuser in a psychodynamic vacuum. All types of drug craving were seen as representing a single disease (Rado 1933) characterized as an impulse disorder in which the "ego is subjugated" by an "archaic need for oral gratification" (Rado 1926, 1933; Fenichel 1945). In the past two decades we have become aware of the adaptive or defensive functions of drug use and abuse (Ausubel 1961; Allen and West 1968; Guarner 1966; Wieder and Kaplan 1969; Hendin 1975). We have also come to realize that heroin, marijuana, LSD, and amphetamines appeal to different kinds of people according to the specific psychopharmacological effects of each drug (Wieder and Kaplan 1969; Hendin 1973a,b, 1974a,b, 1975; Milkman and Frosch 1973). Mixed drug abuse also has its own particular effects and appeal (Hendin 1973b, 1974c). Psychodynamic emphasis, nevertheless, has been too often confined to determining the regressive state produced by each drug and establishing parallels between the regressive state and specific phases of childhood development (Wieder and Kaplan 1969).

We view drug use as part of the individual's attempt to deal with needs and conflicts, relations with others, and the social environment in which he or she lives. Since all of these vary with age and stage of life, one would expect drugs to be used and abused for different purposes at different points in the life cycle. A comparison of our study of adolescent drug abusers and their families with our study of college students who were drug abusers tends to support this conclusion.

COLLEGE STUDENTS

Our study of drug-abusing college students showed that conflicts over performance and competition were pervasive among college students who were marijuana abusers (Hendin 1973a). The same students who advocated a competition-free world saw their own success or failure in terms of murderous aggression or intolerable humiliation. Most retreated from activities that engaged them because they wished to be free of such painfully intense feelings, and they found relief in less challenging activities. No survey of drug incidence or evaluation of students' marks would reflect the numbers of students who withdrew from what they wanted most, to pursue activities with which they were less engaged and by which they were not challenged.

Amphetamine abuse was particularly common among college women. It served the function of helping these women move in directions that they thought they should go but to which their actual inner feelings were opposed (Hendin 1974b). Most commonly, that direction was academic success which they felt was expected by their family and their own image of themselves; in some cases it was a marriage that they thought they should enter into but to which they were inwardly opposed. One of them dreamed of herself as a puppet. Another who dreamed of herself as a marionette saw amphetamines as necessary to move her strings and to keep her performing.

It is interesting to note that while college women were using amphetamines to help increase their achievement levels, college men were using marijuana to help ease or withdraw from competitive pressures. This difference appears to be consonant with the psychosocial changes we are witnessing in the roles of the sexes.

Heroin, too, served specific dynamic functions for the college men who used it. Most of them came to do so during the course of a relationship with a young woman, when heroin was used as a protection against the intensity of the involvement (Hendin 1974a). Pleasure remained under their control; they did not become close to the woman or let her be the major source of pleasure--they saw it as safer to be high on heroin. Because it provided a check on their involvement, heroin was often necessary for them to have a relationship with a woman at all.

Psychedelics and indiscriminate drug abuse were favored by young people who wished to fragment themselves as a way of escaping the sense of constriction and entrapment they had developed in their relationships with their families. Two of them dreamed of themselves as jigsaw puzzles, reflecting their feeling that they could escape only by being torn apart or disassembled (Hendin 1973b, 1974c).

ADOLESCENTS

Most drug abuse begins in adolescence. Since a major adaptive task of adolescence is a change in the individual's relationship to his or her family, one would expect the family to be the arena in which the conflicts that center around drug abuse are expressed.

The parents' difficulties in accepting the changes in relationships with adolescent children have been shown to contribute to the problems (Zinner and Shapiro 1974, 1975). Families are most aware of the drug-abusing youngsters' anger, defiance, destructiveness and perhaps most infuriated by their provocativeness--agreements violated, promises broken, and the like. For some youngsters the anger they feel toward their families is open, often uncontrollable, and frequently frightening to the youngster. Marijuana in particular may be used by youngsters to help them subdue their rage (Allen and West 1968; Hendin 1973a; Hendin et al., in press).

Less accessible to the awareness of these youngsters and their families is their need for the parents' support and approval. The youngsters' defiance and provocativeness serve to force the parents to treat them like young children who have to be watched and controlled, locking them into an angry, dependent relationship. And despite all the anger of the drug abusers toward their families and despite their insistence on a desire for freedom, moving out of their homes and away from this dependent relationship with their parents is extremely difficult for them.

Ackerman's (1958) early family studies highlighted the contribution of the delinquent child (often the scapegoat) to the family situation. Stanton and his coworkers (1978) have developed and applied this concept to their work with drug-abusing youngsters and their families. Our own recent studies of adolescent drug abusers, in which their nondrug-abusing siblings were used as controls, show how family dynamics make it more or less likely for a particular youngster to express his or her difficulties through drug abuse (Hendin et al., in press).

Early childhood experiences play a critical role in determining later vulnerability to drug abuse (Hartmann 1969; Pittel et al. 1971). By the time a child reaches adolescence, parents may have resolved the problems that troubled their marriage earlier or that interfered with their interaction with a particular child. Unfortunately, the youngster will have already suffered the consequences and may, in a sense, make the parents continue to pay for old injuries.

Parental response to the youngster's difficulties must be distinguished from the parent's contribution to the origin of those difficulties. Failure to make this distinction can lead to the mistaken assumption that the family's need for a drug-abusing youngster is responsible for the drug abuse. In some cases the drug abuser brings the family closer together; in others, the family does better when the child leaves home.

What drug abusers derive from their families becomes part of their own adaptation which they express both in and outside the family, and which they will continue to use after leaving the family. It is necessary to understand some of the features of this adaptation to be in a position to understand what role drug abuse serves for an individual.

Solely in terms of the difficulties they create for themselves at home, at school, and with the police, and the ways in which they damage their present and future prospects in life, the drug-abusing youngsters could be characterized as self-destructive. Many of the drug abusers are aware of some desire to harm themselves directly, if only through the use of drugs. Although most speak at first of their drug use as a conflict-free source of pleasure, in time they express somewhat more ambivalence. A young man who claimed to be joyfully high on marijuana whenever he could eventually indicated that he was wasting his life away being stoned, and that marijuana took away his ambition and drive and made him unable to express himself. A young woman indicated that she took drugs with a "let something happen to me" attitude. A young man who claimed his intermittent use of heroin was only a source of pleasure to him dreamed of it as a mixture of milk and poison.

Although virtually all of the drug-abusing young women we have seen had sexual relations, none of them took precautions to prevent pregnancy. All of them eventually revealed a great deal of conflict and guilt over sexual activity which, when combined with their failure to use contraception and a tendency to be involved in relationships that exposed them to abuse or danger, suggested a self-destructive quality to their sexual behavior.

If the chances taken with regard to pregnancy were a reflection of the self-destructiveness of the young women, the chances taken with cars and motor bikes were a comparable measure for the young men. Accidents were frequent; one of the young men we studied was killed when he crashed his motor bike into a truck. Sometimes being stoned or drunk when driving contributed to the accidents, but even in such cases, it only reinforced an already existing recklessness. Driving for these youngsters had an aggressive quality--going over the speed limit, cutting off cars--but the risks some took and the frequency with which they had accidents suggest a self-destructive quality as well.

A grandiose illusion of invulnerability to injury often accompanies such behavior, and a grandiose self-image frequently serves to alleviate the depression and low self-esteem that accompany the self-destructive behavior of drug-abusing young men (Guarner 1966; Hendin et al., in press).

Grandiosity encouraged the sense that magical transformation without effort was possible; the use of drugs to transform their mood helped support this belief. One young drug abuser whose current life was a nightmare believed he was destined for some special fate that would make itself evident in time. Another talked of his special luck, believing that unusual things, both good and bad, happened to him more than to others.

For some of the young people we studied, drug abuse was secondary to other delinquent behavior--usually some form of larceny. Some of the drug-abusing youths occasionally stole money to buy drugs, but such behavior was not central to their adaptation as it was for the delinquent youngsters. Conversely many delinquent youngsters were not drug (or alcohol) abusers.

Many drug-abusing youngsters are conscious of their rage and frustration with their families. To some extent their drug abuse is a way of making their emotions more tolerable. Delinquent youngsters more often use their behavior as a way of expressing their frustration without being aware of what they feel.

Some youngsters, however, see drug abuse itself primarily as a delinquent act and they, too, are often unaware that their abuse has anything to do with their families, so profoundly have they pushed their rage at them out of their consciousness. These young people are invariably unable to deal with their parents directly and are bound in simultaneous needs to defy their parents and to punish themselves for their rebellion.

Drugs provide these young people with both crime and punishment, while removing their defiance away from the direct presence of their parents. One young man would "let his mind float away" and concentrate on music he liked whenever his father berated him. Afterward he went out and took whatever drugs he could buy. While he never connected his drug abuse with his anger toward his father, he often dreamed of it as a crime for which he would be punished. He had a dream in which a riot was going on in another part of town while he was shooting heroin. He was afraid that somehow he would be arrested along with the rioters. Drugs were clearly his way of rioting, of diverting the crime of rebellion to the crime of drug abuse, and of focusing his destructive potential on himself.

The expectation that he would be arrested was revelatory of the appeal of drugs for him and typical of the group. Jail signified to these young men a concrete way of locking up their rage. Drugs permitted them both to contain their rage and to express it in a way that gave them a sense of defiance, however self-damaging that defiance might be. Often young people who are most in trouble with the police over drugs are those for whom the need for crime and punishment is more significant than the need for drugs (Hendin 1975).

Individual and social distress are linked in psychosocial pathology by the destructiveness and self-destructiveness that are common to all of the barometers of psychosocial stress. Failure to understand this has led to confusion concerning the subject of correlations or inverse correlations between one form of psychosocial pathology and another. Suicide will be attributed to alcoholism or drug abuse because of the high frequency of alcoholics and drug abusers among those who kill themselves. A young man may narcotize his depression in alcohol and drugs for years before deciding to kill himself. He may even drink or drug himself to death. In either case, although it may be physiologically accurate, it is psychologically inaccurate to attribute his suicide to alcoholism or drug abuse.

There are a limited number of ways in which psychosocial pathology can express itself--crime, sexual deviancy, suicide, drug or alcohol abuse, etc. The early traumas that predispose to such pathology create a vulnerability that is often not specific to a particular disturbance and is subject to a variety of psychosocial influences.

Once young people have become entrenched in a particular adaptation like drug abuse, however, it is not easy for them to give up the image they have of themselves and the role they have created. One young man was trying to move away from his drug abuse and the nickname he had at school of "burned-out Billy." He spoke of the rigid division of everyone in his school into "jocks," "freaks," or "greasers."

Billy had been lifting weights lately and thought if people at school knew about it they would make fun of him and claim he was a jock. He related a dream in which he was standing on the street wearing his football shirt, when some guys who supplied him with drugs came by in a car. They put him in the car, yelled "jock" at him, beat him up, and as the dream ended, threw him out of the car. After relating the dream, Billy spoke of a fellow he liked who was a good football player--a nice fellow, and not a typical jock. The dream revealed the internal conflict involved in identifying with people whom Billy now admired, adopting a new role, and surrendering his past image as a drug abuser. That he was making the effort was significant, and it seemed likely that he would succeed.

Toward a Sociology of Drug Use

Irving F. Lukoff, Ph.D.

Illicit substance use would appear to be a fruitful arena in which to use sociology to provide us with the insights needed to understand a vast and changing panorama. In very recent history, illicit drug use has engaged most of our youths, at least some of the time, and substantial segments of the adult population. The issue to be discussed here is whether sociology has contributed to our understanding of substance use, particularly the illicit substances proscribed by society.

It is necessary to specify precisely what is meant by a sociology of drug abuse. Although we will refer to the "licit" substances, our main task is to review what sociology has to contribute to our understanding of the use of a range of illicit substances. These include a veritable pharmacopeia of substances: narcotics of various types; marijuana and hashish; cocaine; methaqualone; methadone; inhalants; PCP; and illicitly used prescription drugs, including a wide array of tranquilizers, barbiturates, amphetamines, and similar compounds. Most of our discussion, however, will focus on heroin and marijuana because much more is currently known about the users of these substances.

Not only is there a vast array of substances people use, there is also a very marked selectivity as to who uses which kinds of substances. When LSD was being used by middle-class, college-age youths it was almost unknown in ghetto communities, where the drug users preferred heroin and marijuana. Patterns of drug use are generally not random; that is, the rates will vary sometimes by social class, other times by ethnicity, and almost always by age, since most illicit drug use is concentrated among adolescents and younger adults. Any effort at explanation must note that the use of different substances varies across population groups. Further, usage patterns appear to go through various changes, partly because substances may become unavailable but also because trends abound in drug-using cultures as in other aspects of society.

Except for marijuana and alcohol, the rates of sustained use of most other substances are rare events. This creates an additional problem, that of obtaining sufficient subjects for detailed investigations in most research strategies.

The variability just described, in choice of substances used and the different segments of society using them, raises a fundamental issue--one that is not often confronted. That is, whether drug use is a phenomenon that can be directly explained or whether it is an epiphenomenon, an encrustation on a more basic set of behaviors. One way this is often expressed is whether heroin use causes crime or vice versa or if marijuana use leads to the "hang loose" pattern associated with heavy users (Suchman 1968). There are indeed efforts to describe more elaborate patterns of behavior that cluster with the use of particular substances, that is, lifestyles or typologies, but the implications of this perspective are not often clearly drawn (Nurco and Lerner 1974). The theoretical significance of this distinction is, of course, that what one is endeavoring to understand shifts radically. If one views heroin or LSD or marijuana as the focus for understanding, as an unalloyed dependent variable, then explanations take on one form. This assumption explains the focus on the primary group, particularly the role of friendship networks and attendant processes. On the other hand, if heroin use attracts individuals who are already on the path to systematic deviance and social disengagement, explanations take another form.

The classic thesis of Lindesmith (1947) serves to illustrate this dilemma. He established as a condition for a theory of narcotic use that it must not be idiosyncratic, nor limited to particular cultures or groups. But the use of opiates in very diverse settings involves not only individuals who are immersed in very different social systems, it even involves different forms of opiate use and generally engages individuals of different ages. The diversity that is implicit in this must lead, then, to a theory that is able to abstract social-structural commonalities in very different systems (perhaps insurmountable at this point in time) or one that reduces to an explanation that is primarily focused on properties of the substance. In Lindesmith's case, this becomes the phenomenon of withdrawal and the perception of users that they can only relieve their symptoms by engaging in the use of the drug. This latter explanation cannot be considered a sociological one, irrespective of any merits it may have.

The issue noted earlier, whether heroin use causes criminal behavior, takes on very different meanings, depending on whether heroin is viewed as a discrete behavior that can be isolated from other aspects of a person's life history or is instead simply an attribute of the patterned behavior of individuals (NIDA 1976).

Another question is whether it is possible to integrate all substance use into a single theory. Just as we noted that even a particular substance may be, from one point of view, an epiphenomenon, the wide array of substances that are used also presents problems for anyone who would attempt to include them in a single theoretical framework.

SOME SOCIOLOGICAL PERSPECTIVES

The sociological theories that are most often cited are derived from formulations that were designed to provide insight into delinquency and criminal behavior. We review them in some detail because they illuminate the sociological questions that may be raised. They also direct us to the questions that remain to be answered. The formulation of Merton's essay on "Social Structure and Anomie" (1957, pp. 131-160) is probably the most frequently cited theory. The key feature, and perhaps the primary reason for the theory's attractiveness, is that it is an effort to specify how features of the social structure that are external to the individual actors produce observable patterns of behavior (Stinchcombe 1975, pp. 11-33). As with any effort at sociological explanation, it does not endeavor to account for all varieties of idiosyncratic responses. The theoretical objective is to understand different rates of behavior that are observed in socially important entities such as sex, class, and ethnic groups.

In his well-known formulation, Merton posits two systems: culturally prescribed goals for achievement, and institutionally organized modes for achieving these goals. The feature of this formulation that concerns us is that despite the abundant citation of this theory (Cole 1975), it illustrates another of Merton's observations made elsewhere, namely, that there is a disjunction between theory and empirical research (1957, pp. 131-160). While there are efforts to use at least portions of the theory (as in Jessor 1979 and Jessor et al. 1968), the basic formulation is incompatible with most research strategies. One does not generally observe institutional norms but obtains individual perceptions of these norms, except where legal norms are invoked (Waldorf and Daily 1975). Nor does one readily obtain information on institutional access; one infers them, in most instances, from respondents' reports. While these may reflect larger cultural and structural facts, as Merton and Jessor suggest, it is not altogether clear that one can trace individual perceptions to larger systems except as they appear to be consistent with the assumptions of the theory. For example, lower class adolescents may often see schools as hostile and irrelevant environments for them. One may interpret this as reflecting a reality that blocks a significant route for the achievement of culturally prescribed success goals. However, this is not an unambiguous interpretation. It is equally plausible to view the same information as a response to much more limited spheres--such as cognitive ability or a response to family and peer groups--that socialize lower class youths in ways that are incongruent with the demands of educational or occupational systems. We do not argue for this latter interpretation, nor is it an "unsociological" one. But it illustrates how the same information may be variously interpreted and embedded at different levels of abstraction. The linkages between theory and fact are simply ambiguous without other information, which is often not available.

The derivations from Merton's theory, however, are also troublesome. Merton views drug use (and he appears to have heroin addicts in mind) as a sort of "retreatism," in which individuals eschew culturally prescribed goals for achievement and are barred from or reject access to the goals that facilitate success. The rejection of both goals and means encompasses not only drug addicts, but alcoholics, psychotics, outcasts, and vagabonds. The use of opiates, which are depressants, is consistent with the theme that addicts have little incentive to participate in the activities of the day-to-day world, both its cultural prescriptions and the institutionally approved routes for achievement.

Unfortunately, the facts that have accumulated on addicts, most of them subsequent to the formulation of the theory (1949), are not easily reconciled with the retreatist theme (Lukoff 1972; Lukoff and Brook 1974; Waldorf and Daily 1975). Life is almost frenetic for addicts. In order to survive they must keep out of the way of the police, raise the considerable funds they require, and keep abreast of where drugs might be obtained.

An extension of Merton's formulation is the theory of Cloward and Ohlin (1960), with its focus on the structure of opportunities. They posit a more elaborate organization or criminal activity, in which youngsters who are recruited into crime achieve some of the culturally prescribed rewards associated with achievement. But those who have failed in both the conventional route and the criminal one are double failures and prime candidates for drug use. The significance of this formulation is that it also locates heroin use among the structures that are external to the individual. It appears to comport with the fact that minority youths, who are assumed to have little access to mobility in the ranks of organized crime, have higher rates of drug use than do lower class white youths, who presumably have such access.

It is difficult to document the distribution of various forms of organized crime, or the recruitment of youngsters into these circles, except in illustrative or anecdotal ways (White 1943). The body of findings we will review later suggests that addicts are derived from the same matrix found in nonaddicted delinquents and that there is little to distinguish them from nonusers. And although addicts generally commit fewer violent crimes than nonaddicted criminals, they must be quite good at various forms of hustling and criminal activity in order to survive (Lukoff 1972; Preble and Miller 1977 NIDA 1976).

Despite their failure to explain drug use, the theories of Merton and of Cloward and Ohlin continue to be influential. The problems in specifying universal norms, or reasonably coherent structures that allocate individuals along different paths, are not unique to these formulations. But they are the major efforts that have as their goals the identification of socially structured alternatives within which individuals presumably act out their lives and shape the options available to them (Stinchcombe 1975). While contingent and subcultural patterns may contribute to different modes of expression, they still attempt to specify the broad outlines that direct persons' lives.

Much research on drug use would appear to examine derivative themes that are useful for organizing much of our knowledge. We make no effort to review all of the research in this brief paper, only that portion that directs us to alternative structural sources for understanding drug use and deviance.

SOCIAL LOCATION

Most investigations, even those that are descriptive or primarily epidemiological, without any clear theoretical agenda, generally examine substance use rates by age, sex, social class, and race/ethnicity (Abelson et al. 1977; Johnston et al. 1979; O'Donnell et al. 1976). Social class and race/ethnicity serve as surrogates for socially significant structural parameters. Where patterned differences emerge, they appear to reflect the different propensities these groups have for drug experimentation. The theoretical issue, at first glance, is to comprehend how social location affects individuals located differentially within society.

But illicit substance use is very volatile, even over relatively short historical epochs. Currently, heroin use is concentrated in black and Hispanic communities, which appears to suggest that both lower socioeconomic status and belonging to disadvantaged minorities provide important clues to the attraction of heroin use. However, at the turn of the century, opiate use, in various forms, was found primarily in white, middle-class females as a result of therapeutic use (Ball 1970; Ball and Bates 1970; Commission of Inquiry into the Non-Medical Use of Drugs 1973). In Britain, heroin users roughly match the class distribution of the larger society, and blacks are underrepresented (Commission of Inquiry into the Non-Medical Use of Drugs 1973). A closer examination of heroin use in ghetto communities in the United States reveals a more complex relationship of stratification to heroin use. Vaillant (1966b) contrasted Lexington addicts against their own communities and observed they were better educated than their comparable age-mates in the same tracts. In a survey of an urban ghetto community, it was found that reported heroin use was associated with higher socioeconomic status, although this, as we will see, was a spurious relationship (Lukoff and Brook 1974; Lukoff 1977). Thus, heroin users are not necessarily drawn from the most impoverished segments of the communities, where use is currently concentrated (Nurco 1979; Robins 1975a). Nor, as their education and intelligence suggest, are they necessarily those who should appear to be doomed to the margins of society (Ball and Bates 1970). Only when contrasted against the larger society do socioeconomic status and lower education appear to be related to heroin use. This, however, appears to be the wrong way to examine the information. Instead, the relevant contrast would appear to be to examine heroin users against the backdrop of their own communities. Then the picture shifts substantially.

Because heroin use is a relatively rare event, most general population surveys report too few users for reliable estimates. Thus, caution is necessary in interpreting trends. In a study of selective service registrants, O'Donnell and his colleagues (1976), when examining reported narcotic use by cohorts, showed that there was a decline among blacks in the later cohort, with an accompanying increase among whites. In a survey of blacks in Harlem, Brunswick and Boyle (1979) examined rates by cohorts and observed a decline in initiation into heroin use among younger members of their panel. Although it bears repeating that caution should be used, such trends do suggest how ephemeral heroin or other narcotic use might be in historic perspective, and that the clues to its use might be elsewhere than in the simple matter of gross contrasts by class or race observable in any one epoch.

The dynamic nature of drug use trends is even clearer for marijuana. When Becker (1963) investigated marijuana use two decades ago, it was largely confined to inner city blacks and jazz musicians. Currently, marijuana competes with alcohol as the most popular drug, especially among the young (Jessor and Jessor 1977; Johnston et al. 1978; Kandel 1978a). Jessor and Jessor (1978), in reviewing marijuana trends, observe that there is a declining significance of such factors as "urbanicity," race, and socioeconomic status. Even sex differences are declining, although they appear to persist for heroin use. "At the level of the demographic environment then there has been a trend toward homogenization as far as variation in marijuana use is concerned" (Jessor and Jessor 1978, p. 341). It is increasingly smoked in public settings; legal penalties in many places have been reduced; sanctions, where they exist, are often not invoked for possession of small quantities for personal use. Even when sanctions were punitive, marijuana use continued to increase in popularity, both for those who have ever tried it and among the proportion who use it with reasonable frequency. Thus, normative systems are often only marginally effective, and they are subject to rapid change as the larger community begins to accommodate the persistent and pervasive use of the substance.

If most of the usual indicators of social location show declining significance, one persistent feature of marijuana use continues to be important: The vast majority of users are young. And increasingly, the age of onset of marijuana use appears to be declining (Abelson et al. 1977; Johnston et al. 1979). Because of the relatively short time in which marijuana use has become popular, it is possible that current youthful and young adult users will continue to use it as they become older.

The same persistent relationship to age is present among heroin users. Almost all users start when young, at least in the United States experience (Brunswick and Boyle 1979; Lukoff 1972; Nurco 1979; Robins 1975a). As cohorts of adults advance in age, the largest proportion who were addicted abandon heroin use. Winick (1964) estimates the typical duration of addiction to be just over eight years. Although older addicts exist, the heroin-using population is still weighted toward those who are relatively young.

Thus, the one unambiguous association with drug use, one that appears to persist, at least in Western cultures, is the relationship of drug use to youthfulness (Braucht et al. 1973). Most of those who experiment with illicit drugs are young; those who become addicted, where there is information, decrease or cease drug use with advancing age. Structural variables such as social class and race/ethnicity are much more ambiguously related to drug use, as our review of trends suggests. We exclude the misuse of medically prescribed drugs because they would appear to present very different configurations.

SOCIALIZATION

The identification of social norms assumes that behavior is transmitted to actors who, depending on circumstances, tend to adhere to appropriate beliefs and concomitant behaviors. This explains the emphasis on socialization in the research literature, although sometimes only the "end product," the beliefs themselves, is identified and assumed to have been somehow transmitted (Jessor et al. 1968; Merton 1957). The search for antecedents of personality, rooted in family childrearing practices, overlaps with the effort to identify how cultural values and norms are communicated to the young (Brook et al. 1977a,b, 1978; Lukoff 1977).

But socialization is not limited to the family. Other agencies of social control also contribute, sometimes with perspectives that are at variance with those of the family. The most heavily investigated area has been the impact of peer groups (Becker 1963; Braucht et al. 1973; Feldman 1968) and the attendant mechanisms that shape the choice of friends and influence the accommodation to the behaviors and values of peers.

This raises two theoretical issues. The first is the identification of the countervailing forces that influence the decline of parental legitimacy, as well as of other agencies that promote conventional behavior. The second issue is the way in which adolescents develop a peer culture with alternate value systems and goals (Becker 1963; Feldman 1968; O'Donnell et al. 1976; Whyte 1943).

There is one thing, however, which is not altogether congruent with the above statement. The literature on family socialization of adolescents has two foci, and many variations within each. First, there is a focus on the models family members provide for the use of drugs, tobacco, alcohol, or even medically prescribed, mood-altering drugs (Brook et al. 1977a, 1978; Kandel et al. 1978). Here, the assumption is that children will emulate their parents' use regardless of the choice of substance. From this perspective, although substances may change, there should be a continuity across generations. The findings are generally consistent with this assumption, although less powerful than one might expect. This may be an artifact because rates of reported use by family members whether obtained from adolescents or from parents are generally very low compared to the rates of usage of illicit drugs by adolescents. Alcohol, of course, differs in this respect from illicit substances (Braucht et al. 1973). The direct modeling of parents' behaviors is unlikely to explain a great deal of the usage by younger individuals where rates of use decline rapidly after the mid-twenties (Abelson et al. 1977).

The other focus is the examination of various forms of childrearing as well as the quality of the parent-child relationship, i.e., whether there is warmth and affection between them. These studies generally indicate that parental rules are related to adolescent drug use (Brook et al. 1977a, 1978). More proscriptive orientations are associated with lower rates of drug use. In addition, adolescents who report positively on their parents also tend to have lower rates of involvement with illicit substances (Gerstein 1976). This is an important research direction that has its own utility.

From the perspective laid out at the beginning of this paper, however, these are intervening processes. Since the purpose of this paper is to identify aspects of the social structure that ultimately affect adolescents and young adults, it is necessary to recast the issue in order to attempt to understand what it is about the social structure that may result in variations in the form of socialization.

Although not ordinarily viewed in the context of socialization, age of onset of drug use serves as a surrogate index for an important dimension of socialization, namely, the unfettering of the bonds of social control. Early onset reflects the premature segmentalizing, or insulation, of youthful activities from the normative system of the adult community. Those who start young are more likely to persist in substance use and other forms of deviance and to resist the blandishments of treatment (Commission of Inquiry into the Non-Medical Use of Drugs 1973; Lukoff 1972; NIDA 1976). Referring to narcotics users, Nurco (1979, p. 321) states, "The earlier the onset of deviant behaviors, the more malignant the process invoked and the more ominous the prognosis. . . . The younger the age of onset the more intense and committed the addictive career."

The early onset of drug use and other forms of deviance means that individuals are less likely to complete school, to have a history of sustained employment, or to engage in other adolescent or young adult activities that facilitate passage to adult status. In this sense, their socialization is truncated, and they are less prepared to assume the requirements of adult roles of their communities. They are only marginally connected to the adult worlds of their respective communities. Adolescent lifestyles, congregating with peers, avoiding employment and family relationships may persist until the person is quite advanced in age (Preble and Miller 1977).

Equally important is the fact that, as Robins (1979) has noted, any form of deviance, particularly among the young, forecasts other forms of deviance, including alcohol consumption, school deportment, delinquency, and early sexual promiscuity. There are several possible implications, but the one that concerns us here is that the roots of deviance are shared by many forms of problem behavior. The form that problem behavior takes, while it may in part reflect personal dispositions, is primarily a response to the encounters with other individuals, the peer cultures of adolescents and young adults.

The longitudinal reconstruction of substance use by Robins (1975a), from premilitary usage through Vietnam and after discharge, dramatically illustrated how easy access to heroin inflated use rates substantially. Almost all soldiers in Vietnam would presumably have had easy access to heroin, but not all of them used it. But those who scored high on preservice deviance were about four times as likely to initiate use as those who were low in deviance. These findings underscore that while proximal settings, where drugs are plentiful, markedly affect rates of use, earlier histories also exert a powerful influence. The fact that among heroin users there is often a history of delinquency prior to the onset of use is consistent with these findings (Lukoff 1972; NIDA 1976).

Despite the addictive potential of heroin, for some individuals involvement is only experimental or sporadic; others appear to cease use without the assistance of treatment or to accommodate the goals of treatment programs. Although scarcely studied, the information that is available indicates that such individuals are less alienated or disengaged from family and work, and less intensively immersed in drug-using groups (Lukoff 1974; Robins 1979; Zinberg 1979).

Because marijuana is a common recreational drug for so many persons, the factors involved in its use are more diverse than those for heroin use. It appears necessary, for example, to distinguish between persons in a late-onset, sporadic-use group and persons in an early-onset, frequent-use (generally daily) group. For those in the first group, use is confined to specific social contexts in which it is simply a cultural trend, much like tastes in music or clothing (i.e., the use is governed by proximal variables reflecting aspects of the current social milieu). In the second group, use can be predicted from antecedent variables, such as perceived or actual parental roles and the quality of familial relationships (Jessor and Jessor 1977; Jessor et al. 1968; Braucht et al. 1973; Brook et al. 1977a, 1978; Lukoff 1977).

As marijuana use moved from vanguard users who adopted the drug when it was still subject to heavy penalties, it appears to have also attracted individuals who, in varying degrees, were less likely to be engaged in subcultures that held perspectives divergent from those of the larger society.

Although concepts used in the many investigations reflect the general anarchy in a great deal of social research, one trend appears to persist, namely, that youthful onset of marijuana use is associated with a slackening of parental controls, early rebelliousness, and the presence of a wide array of behaviors incongruent with the expectations of the family, i.e., adult controls are markedly attenuated so that the discontinuity between generations is exacerbated (Braucht et al. 1973; Jessor and Jessor 1977; Kandel 1978a).

GENERATIONAL DISJUNCTIONS

Drug use, at least for the committed user, is always more than simply a preference for a particular substance, or only a habituation that can be slaked by repeated use of the drug. It is immersed in a more coherent lifestyle pattern, one that involves values and goals and patterns of relationships. It is, therefore, part of a process of the emergence of cultural systems that are innovative, at least by the standards of the communities from which drug users derive. Thus, the question implied earlier: How do variant lifestyles emerge in which drug use becomes a component element? If the family and the other agencies of social control were consistently effective, there would be little illicit drug use because it has not been a major feature of adult lifestyles.

Socialization implies some form of inculcation of basic adaptive strategies of younger people, an activity ordinarily consigned to the family, schools, churches. But this process is never wholly successful and competition can come from other sources, the most common being agemates. There is evidence, however, that the mere association with others who use drugs, while a necessary feature of drug use, certainly during initiation, is not sufficient to explain drug use. Andrews and Kandel (1979) have demonstrated that there is a presocialization process in the sense that those who initiate use have already acquired the attitudes that facilitate drug use. Jessor and Jessor (1977) note that while marijuana users almost always are associated with a network of users, there are also individuals who choose not to use drugs. Among those who have experimented with heroin and remain in close association with heroin users there are many who pull back.

Vaillant (1966b) who observed that heroin users were overrepresented by native-born offspring of migrant parents--not the children of migrants who had been brought up elsewhere before coming to urban areas--hypothesized that there was a cultural disparity between the generations that appeared to increase susceptibility to heroin use. Lukoff and Brook (1974) observed that reported heroin users in a ghetto community were disproportionately derived from the higher socioeconomic groups within the community, but that this was a function of the higher socioeconomic standing of the native-born when compared to migrants. The key element, then, was the migrant-native status, with the native-born overrepresented among the users of heroin. In the same investigation there was also a correspondence of viewpoints toward childrearing that accounted for the generational differences. Migrants in all four ethnic groups, American black, black British West Indians, whites, and Puerto Ricans, subscribed to more proscriptive and controlling orientations toward children than did native-born members of those groups. Although reported heroin use differed between the groups, the same consistent relationship appeared: families that were less proscriptive, even among migrants, reported higher rates of heroin use and closer contact with users of heroin.

The socialization studies cited earily appear to be consistent with the above findings (Braucht et al. 1973; Commission of Inquiry into the Non-Medical Use of Drugs 1973; Gerstein 1976). Insofar as parental ideologies are oriented toward greater control and monitoring of children, drug initiation appears to decline. At another extreme, when heroin users have been studied, generally retrospectively, there appears to be markedly disturbed family backgrounds in which the families of origin are often abusive or unable to monitor the activities of their children effectively (Commission of Inquiry into the Non-Medical Use of Drugs 1973; Robins 1975a; Zinberg 1979).

Whether we speak of the markedly deviant lifestyle of the heroin addict or the more "laid back" patterns of the middle-class psychedelic user, both patterns can only evolve when youth cultures operate with relative freedom, in isolation from the agencies of social control. This also presumes that the usual socialization mechanisms, including but not limited to the family, have declining legitimacy. There appear to be several possible causes for this situation.

There is, first, the diversity of the urban social environment. Contrast this with individuals from rural backgrounds in which there are few competing cultural systems. Thus, not only is the adherence to community norms more difficult, but there are attractive alternative systems that can be observed and to which one can often gain access.

There is also the increasing isolation of the family. It is not just that more families are headed by single parents, since this has not been unequivocally associated with heroin use (Lukoff and Brook 1974). It is more likely that the networks of family support systems are smaller, and, by the very nature of the urban environment, even when present, are less likely to affect young people. One does not often encounter an aunt, uncle, or cousin who can report to one's parents, as happens in smaller communities or in rural areas. In addition, more of the activities formerly confined to the family are now performed elsewhere, from preschool through a longer and more extended schooling period where primary adult groups have minimal impact.

Larger social changes are difficult to link to various forms of youthful rebellion. We can only note that it is in urban areas that traditional segregation norms began to lose hold. With the rejection of the adults who accommodated the restrictions imposed on blacks, the legitimacy of the conventional society of the ghettos also declined in significance. Among middle-class, mainly white youths, the disparity between voiced values and reality attracted increasing attention, whether it was the civil rights struggle, or opposition to a war for which they could find no justification. This often was translated by many young people into a rejection of the entire middle-class value system. With the declining legitimacy of the usual agents of social control, the possibility for innovation, always present among young people, appears to have escalated. It is in these contexts that drug use increased, from an activity engaged in by only a few, to one that has become, at least for marijuana, a normal part of the youth culture.

Parental ideologies toward children appear to be implicated. Several of the investigations cited earlier note that parental orientations toward childrearing appear to be consistently related to the initiation of drug use. The ideology of self-determination of children is another factor. An outcome of urban sophistication, it is not so prevalent in small towns and rural communities, nor is it shared by migrants from more traditional cultures, though it is soon incorporated in the ideologies of their descendants. This is often accompanied by a declining willingness to enforce controls and monitor the activities of children and is often accompanied by more extensive use of surrogate guardians. When the rewards, as perceived by the children, appear more exciting and challenging elsewhere, the options provided by the family appear to decline in influence. And so a greater receptivity to encounters with peers would seem to be a consequence of the lessened "internalization" of norms and values derived from the family.

We have only roughly sketched in some possible sources of the way in which youth cultures appear to have greater priority in the evolution of new values and behaviors, with illicit substance use an important component of these activities. The form it takes, from the "hang loose" orientation described by Suchman, or the "hippie" culture of the 1960s, or the "cool cat" of the ghettos, depends on subcultural forms within the communities and the kinds of values and activities, often derived from the adult culture, but profoundly transformed in the process, that are available. In this brief paper we cannot explore this area in detail, but it appears that the choice of adaptive styles, while at variance with the community's system of values, is in important aspects a facet of that system.

CONCLUSION

In this paper we argue that the key social structural feature associated with drug use is found in the one unambiguous association, that of illicit substance use with young people. In fact, the evidence seems to point to a lowering of the age at which individuals commence the use of illicit substances (Abelson et al. 1977; Johnston et al. 1979). Other structural features such as social class or ethnic group membership, while clearly associated with many aspects of drug use, when examined historically and even in the short period of the past few decades, are seen to be only ephemerally related. It appears that the indigenous cultures are shaping forces, but they do not play a decisive role. What we have said appears to be true for the United States, and perhaps for western Europe, but it does not hold for narcotics use by medical practitioners or by Middle Eastern rural dwellers.

We also advance the view that it is less useful to speak of drug use alone, because those who are heavily invested in drug use are also part of more integrated lifestyles, different in the ghettos than on the campuses, but at variance with many aspects of conventional adult culture. We suggest that marijuana in particular, since it is used by the majority of young people, may be peripheral for many. But for those who start when young and use with reasonable frequency, the evidence is consistent with the theme that illicit substance use is not an isolatable phenomenon, but must be understood in a larger context. And where there is information on who uses drugs there appears to be a process of disengagement from conventional values and norms that precedes initiation. We suggest the sources of the rapid escalation of drug use are located in the forces that influence the declining legitimacy of conventional norms and values and agents of social control on the one hand, and in the structural forces that increase the opportunities for younger people to operate with greater freedom outside the confines of the usual control mechanisms. In this sense, drug use and the attendant cultural prescriptions represent a process of social change.

Achievement, Anxiety, and Addiction

Rajendra K. Misra, D. Phil.

Drug abuse is a response to fear of failure; it helps us to withdraw from the pressures of achievement by inducing and maintaining a sense of apathy toward the standards of excellence in society. Tensions and stress of lifestyle in urban and developed societies are marked by pressure for achieving goals that subscribe to the so-called "approved" quality of life.

CULTURAL PERSPECTIVE

Drug abuse, or at least its impact, seems to be more common in the technologically developed societies than in the developing ones. Industrialized cultures are quite regimented in terms of their standards of excellence. There are definite, clearly identified criteria for goal attainment. Quality of life is measurable. The indicators of happiness are concrete and specific. In the United States, for instance, the standards of excellence are more visual and substantive than, say, in India, where about 70 percent of the population live in rural areas and depend on agriculture for a living. In India, belief in (a) the transmigration of the soul, (b) the birth-rebirth cycle, and (c) the goal of life being the ability to break away from the birth-rebirth process and merge with the Supreme Being do not encourage preoccupation with earthly, material things. The quality of life is relatively vague in its beginning and ending. Standards of excellence are fewer than in the developed nations. Pressures for achievement are relatively mild; penalties for failure, few. Blended with this sociocultural ethos are the religious sanctions against taking bhang (hashish) or smoking marijuana, except during the specified religious festivals, when drugs are often a part of the ritual.

In any culture, celebration is marked by (relatively) inhibited expression of emotions (usually love and anger). Social and cultural systems build in occasions for celebration of the basic historical and religious traditions. Two features of any celebration are food and emotion, the assumption being that the chores and routines of day-to-day living tend to restrain eating and expression. An average Indian lunches on a paratha (shallow, fried, layered bread made with whole wheat flour) and curried potatoes. An average American grabs a sandwich and washes it down with a soft drink. Emotional expression is also restrained. Smiles are closer to courtesy than to feelings. Self-control and restrained expression day after day and week after week program us somewhat for an almost computerized lifestyle. Even television comedy shows sandwich "canned" laughter in between the scenes as if to remind the audience about the humor.

Celebrations acquire special significance against this backdrop of dry and dreary lifestyle. We have to plan to relax. It is not uncommon for people to go on a strict diet before going on a vacation so that they can eat without much guilt. Even more important is the expression of emotions. The recent mushrooming of the "pop" therapy methods (encounter groups, marathons, self-improvement techniques, stress management, and so forth) illustrates our obsession with inhibited expression.

ACHIEVEMENT ANXIETY

In the developing countries, however, because of relatively less pressure for achievement, celebrations are observed more frequently and for longer duration. Methods of relaxation usually consist of visiting with friends and going to movies. In a developed nation like the United States, people just do not have time for much relaxation. An American, creatively enough, treats living and working as synonymous. The weekends are planned and filled as tightly as are the weekdays. Relaxation is not "doing nothing"; it is another kind of work. Weekend golfers, painters, and vacationers love to achieve standards of excellence in their relaxation ventures. It is not enough to feel that "my vacation was relaxing"; I also want to feel, prove, and publicize that "my vacation was better than yours."

We do not mind trading relaxation for tension: Borrowing money to go on a vacation is a good example of this. Doing something rather than nothing is the hallmark of relaxation. Frequently, one is as tense about seeking relief as one is about achieving work goals. Relaxation must be achieved, here and now. A sense of immediacy encourages search for time-saving techniques for achieving peace and tranquility. Drug abuse emerges as a natural corollary to this way of life. In the speed-oriented culture of the United States, for instance, drug abuse is a handy device for "getting away from it all" (Misra 1975). Chemical aids for feeling "fresh and relaxed" are so widely publicized through the media that it is extremely difficult to resist the temptation for this shortcut to happiness.

The vast range of data in the media, including advertisements for automobiles, homes, food, vacations, and so on, describes and perhaps even sets the goals we are expected to achieve to qualify as "leading a good life." The focus is on what, not how, to attain in order to have a feeling of achievement, a sense of satisfaction.

Availability of options causes anxiety. Different goals are perceived in terms of their potential value to satisfy our needs. Do we buy an automobile to get from one place to the other? Maybe. But also to acquire status, power, and prestige. It is not easy to decide on the kind of car we want to buy, essentially because there are so many to choose from. The situation is the same in many other areas: cereals, bread, cheese, vacation, home, and so forth. Any time you decide in favor of one goal over the other, the latter will look better (at least most of the time). We must then try to convince ourselves that the option we chose was indeed superior to the one we did not. Industrial cultures encourage a rat race for status and identity, with everyone striving hard to "be somebody."

SUMMARY

Drug use is initiated as a time-saving device to cope with the stress of achieving standards of excellence. Chemically induced relaxation is simple and quick. The ease and speed with which feelings of relief can be attained encourages the continuation of drug use. Initially, drugs are used to escape from the pressures of achievement, but gradually, the thrill becomes the goal, marking the conversion of use into abuse. Cessation of drug abuse is an awfully slow process because it involves changes in one's lifestyle. The whole area of goal-setting behavior must be addressed before the chemically convenient coping strategies, nothing more than acts of slow suicide, can be controlled.

PROBLEM BEHAVIORS

Drugs do seem to have the advantage of calming down our anxiety about achievement. However, the process by which this is done has also an important negative effect insofar as it induces a sense of defiant indifference. In most cases, excessive use (abuse) of drugs increases our level of confidence. (One person under the influence of LSD believed he could fly: He jumped out of a 17th floor window and died.) This, however, is a compensation for the underlying achievement anxiety, which was initially a response to our feelings of inadequacy. It is no wonder, then, that drug abusers have a higher proclivity for engaging in antisocial behaviors. The so-called "morning after" effect reflects a sense of depression and remorse for the night before. Depression leads to anxiety, which, in turn, leads to increased need for chemical relief, and so goes the process of strengthening the anxiety which was the cause for initiating the abuse of drugs in the first place.

We tend to overlook the fact that drug abuse is a response to our fear of failure: It starts as a "little break" from the pressures of achievement but then, over a period of time, becomes a goal in itself. We start using drugs when we are emotionally upset. A temporary feeling of relief is all we desire. Once the effect wears off, we are back again in the jungle of competitive culture, and once again, we resort to chemical aids to have a feeling of thrill and happiness. The process continues until achieving the thrill becomes our goal. The need for temporary relief is transformed into the ultimate goal of achieving a state of nothingness.

In a lifestyle marked by hedonism, a sense of consideration for others becomes the least important of all needs. The most crucial need is for a child-like, impulsive happiness (Clements and Simpson 1978). Law and order tend to be perceived as evil forces in society. Thus, the relationship between problem behaviors and drug abuse is as predictable as water boiling at 100°C.

The Natural History of Drug Abuse

Lee N. Robins, Ph.D.

INTRODUCTION

The first step in discussing the natural history of drug abuse has to be to offer a definition of what we mean by drug abuse. By "drugs" we will mean only illicitly used psychoactive drugs--that is, either those bought through illegal channels or obtained legally but used by persons for whom they were not prescribed or in quantities larger than prescribed or for purposes other than those for which they were prescribed. By "abuse" we mean all such illicit use up to the point of addiction. The reason for selecting this definition of "abuse" is primarily a practical one. Stopping short of addiction conforms to the definitions of substance or drug abuse in ICD-9 and DSM-III, where "abuse" is used to categorize problems with drugs which do not encompass drug dependence.

While our separation of "abuse" from dependency conforms with ICD-9 and DSM-III,[1] we will not require social or health *problems* resulting from use, as these sources do when they define abuse. Because we are discussing only the *illicit* use of drugs, one could justifiably argue that any use constitutes abuse. But a more telling reason for not attempting to distinguish abuse from use is that most of the studies on which we will draw have not made this distinction. Further, since abuse inevitably must be preceded by use, use would play a part in the natural history of abuse as a predisposing factor in any case.

This paper is extracted from "The Natural History of Drug Abuse," presented at a symposium on treatment evaluation in drug abuse, 19th Scandinavian Psychiatric Congress, Uppsala, Sweden, June 15, 1979. The work was supported in part by USPHS grants DA 00013, DA 000259, and MH 31302.

[1] ICD-9 is the 9th revision of the *International Classification of Disease* by the World Health Organization; *DSM-III* is the American Psychiatric Association's *Diagnostic and Statistical Manual*.

Having decided that our review will encompass any use of illicit drugs short of addiction, we still need to decide whether drug abuse thus defined has a natural history to describe. Unlike schizophrenia, which is a rare disorder but one which is recognizable in every culture and in every historical period, drug abuse has emerged as a series of "epidemics" of abuse of different drugs affecting different age, sex, and socioeconomic groups at different historical times and in different countries. As the groups affected vary, the natural history may vary, just as the natural history of measles differs in adults and children, and in children who are chronically undernourished as compared with those who are well fed. The particular drug or drugs abused may each have its own natural history of abuse, as well. To take an analogy from the infectious diseases, to attempt to talk about a natural history of drug abuse may be equivalent to trying to describe the natural history of "infection," rather than the natural history of particular infectious diseases. As both agent and host vary over time and place, our description may be accurate only for a particular moment in time and a particular location. Thus while we can describe the natural history of schizophrenia with some confidence as a rare disorder having its onset in young adulthood, and having a chronic course if untreated, there is no such simple description of the natural history of drug abuse.

Recognizing these limitations, we will nonetheless attempt to fashion a natural history by summarizing what is known about the circumstances of initiation, which groups are most vulnerable to drug abuse, motivations for use, how drugs are taken, to what extent dosages tend to increase, and finally, we will attempt to interpret these findings by asking to what extent the natural history of drug abuse suggests that it is a disorder for which those with antisocial personalities are particularly at risk.

In order to present this picture, we will draw on a variety of studies, but many of our illustrations will come often from our own study of Vietnam veterans, because it is the largest study so far of persons who have been involved in more than casual use of illicit drugs.

A BRIEF HISTORICAL NOTE

Few drugs have been illicit from the moment of their discovery or synthesis. Generally drugs have been defined as illegal only as evidence for problems resulting from their use appeared. Many drugs now illegal have enjoyed a period of legal popularity with the upper and middle classes. As their legal status changed, so did their clientele. Those drugs now valued for their ability to create illicit pleasures have previously been used to relieve physical pain, as cough medicines, as cures for diarrhea, as sleeping potions, as health-giving "tonics," as means of improving daily work performance, and even as cures for dependence on other drugs.

After World War I, in the United States the Harrison Act marked a major attempt to make psychoactive drugs illegal. With this effort there came a reduction in their prescription by physicians and a decline in their use by the middle class. Use became concentrated in various "outsider" groups, such as musicians and minority groups. Since World War II, drug use has become much more widespread. It spread first within the segregated black ghettoes of the United States and from there to urban middle-class college students. From them it spread to their younger siblings, and to working-class youths and rural populations. Over the course of the last 30 years, the tendency has been for larger and larger groups to become involved and for age of initiation to decline.

In many parts of the world where the older patterns of use by middle-class and rural populations were less forcibly suppressed by legal sanctions, this new pattern of use by urban youths has been superimposed on the traditional pattern. In South America, for instance, urban high school and college students are using marijuana just as children in Europe and America do, but at the same time the coca chewing in the Bolivian highlands continues, with little communication between the two drug cultures.

With the spread of illicit drug use to middle-class youths, there has occurred an enormous increase in drug research, most of it focusing only on this newer postwar pattern. As a result, our ability to describe the "natural history of drug abuse" is in general only an ability to describe the present historical phase. While this limitation must make us wonder about the generalizability of our conclusions, we are fortunate in having available a number of large, well-executed studies that provide documentation of the current drug abuse phenomena that is probably more complete than that available for any other topic of current psychiatric interest.

STUDIES OF THE "NEW" DRUG ABUSE

Among the studies that are most important are those by Lloyd Johnston (1973), which followed tenth graders until a year past high school graduation. They were then asked about their drug use in their senior year of high school and their use in the following year. Johnston is currently doing a similar study beginning with five cohorts of high school seniors each being followed for five years (Johnston et al. 1977).

Another extremely important study was done by O'Donnell et al. in 1976. A large sample of men 20 to 30 was selected from military draft registrations, located, and interviewed about their lifetime drug experiences.

There have been many studies of school populations. Among the most interesting are Kellam et al.'s followup of black first-grade students in Chicago to age 17 (in press), in which they look for predictors in first grade of later drug use. Kandel et al. (1978) did a survey in high schools throughout New York State, and followed their respondents five months later. Their particular interest was in the respective roles of parents and peers in introduction to illicit drug use. The Jessors (1977) did a four-year followup study of both high school and college students, in which they were able to watch the emergence of drug use year by year. Smith (1977) has been following fourth to twelfth graders after four years. Mellinger and Mannheimer are studying the development of drug use in college students (cited in Smith 1977).

Our own work has covered two populations, young blacks and Vietnam veterans. The study of young black men in the mid-1960s was the first nonpatient, nonstudent survey of drug abuse (Robins and Murphy 1967). Later we studied a large sample of Vietnam veterans who had served in Vietnam at the height of the availability of heroin there, and a matched nonveteran control group (Robins et al. 1977).

Our conclusions about the natural history of drug abuse stem mainly from these studies. Thus we will be describing the drug experience of young people in the United States during the 1960s and 1970s.

VULNERABILITY TO DRUG USE

Drug abuse has spread remarkably in the United States, so that current estimates of the number of high school seniors who have used some illicit drug are over 60 percent (Johnston et al. 1977). As the proportion approaches 100 percent, it becomes impossible to identify a nonvulnerable segment. At this time, however, it is still possible to find some descriptors of persons who are more likely to use illicit drugs, and particularly those more likely to use them early, or to use them more frequently than average, or to use a greater variety of drugs than average.

It is clear that the characteristics of the "new" drug users are very different from the characteristics of the former users. The former users tended to be middle-aged or older women who had a high rate of visiting doctors, and who were well integrated into the "establishment." Young users of illicit drugs differ from them in terms of their demographic characteristics, their family settings, and the kinds of people with whom they associate. Since World War II, young drug users have tended to be urban, male, minority-group members, particularly black and Spanish-American. It has been thought that these young people were from the lowest social stratum, perhaps because impressions were based on those persons who sought treatment only after becoming chronically unemployed. Since drug use is especially common among minority groups, users necessarily include persons of lower class backgrounds. However, neither the minority-group nor the majority-group users come from particularly economically disadvantaged families relative to their own groups, perhaps reflecting the high cost of drugs. The parents of drug abusers, if not poor, do have more than their share of broken marriages, and tend to have a history of excess use of alcohol and psychotherapeutic drugs. The friends of users are themselves users, and support the use of drugs, which makes it easy for the nonuser to obtain the drugs and to find encouragement for their use.

One of the most striking findings of these studies is the brief age span in which the onset of illicit drug use typically occurs. The period of risk begins in the teens and ends by the mid-twenties. As the number of drug users in this age group has increased, there has been a ripple effect to other age brackets, with greatest increase in just younger and just older groups, but first use remains unusual before age 13 or after 25.

The personal characteristics of those particularly liable to use drugs have been obtained by comparing using with nonusing adolescents in the same schools. One of the characteristics looked at from time to time is IQ. The IQ of drug users tends to be good to superior, quite different from that reported for the typical delinquent, whose IQ is slightly below normal. Despite their good IQs, prospective drug users tend to be underachievers in school. They report a lack of motivation to do well at school; they are not particularly interested in going on to college; and they generally don't like school very much. In early studies of drug-abusing students, it was hypothesized that they had serious personal problems that motivated them to seek escape from reality. There seems to be little evidence for this view. In fact, rather than being maladjusted isolates, drug abusers tend to be more sociable than average. This would seem necessary if they are to have access to drugs through friends. On the other hand, there is some evidence from Kandel et al.'s work that they have more depressive symptoms than nonusers (1978), which suggests that at least occasionally, drugs may be used to treat such feelings.

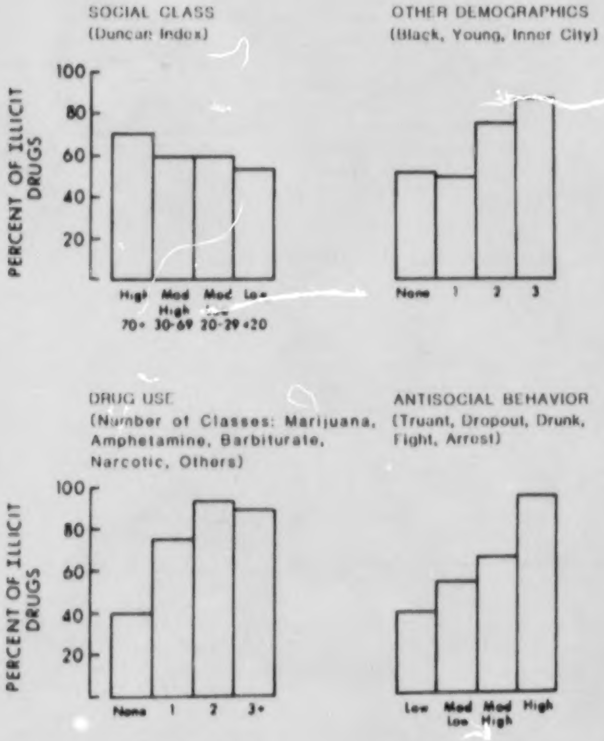
The behavior of drug abusers prior to the onset of drugs resembles that of mild delinquents. They tend to be sexually active at a very young age; they tend to have committed a number of minor socially disapproved acts, such as getting into fights, truancy, getting drunk at a young age, and smoking early. Few have held full-time jobs at the time they take up drug abuse. If they delay drug use until they enter college, those in the humanities or social sciences seem more vulnerable than those in the hard sciences and mathematics. The belief system of those vulnerable to drug use has clearly been nonconformist. They are generally areligious, not greatly attached to home, and generally tolerant of deviance in others. They do not, for instance, voice strong disapproval of shoplifting or truancy.

The characteristics we have described not only tell us which children who have not yet used drugs are particularly liable to become drug users, but they also predict the timing of use--those with these characteristics tend to use at a younger age than those without them--and the frequency of use--those who have these characteristics tend to use more heavily than children without these characteristics even when both use drugs.

Most of the results that we have presented so far come from studies of high school and college populations. These findings apply principally to the use of marijuana, since that is the only drug used with sufficient frequency to be well studied in such general populations. It is interesting, therefore, to compare these results with our results from the Vietnam veteran study, in which we were studying men with easy access in Vietnam not only to marijuana but also to narcotics. We studied a sample of about 1,000 Army enlisted men at ten months after their return from Vietnam, and we then reexamined a selected two-thirds of them when they had been back in the States three years. All had left Vietnam during the month of September 1971. We interviewed 96 percent of our target sample the first time, and 94 percent of that part of the selected sample that we intended to interview the second time. We matched these veterans with a group of nonveterans chosen from draft registrations, in order to see whether the same use patterns held for men who did not serve in Vietnam. At the time we interviewed the veterans for the second time, most were 23 to 24 years of age. In figure 1, we look at preservice predictors of their drug use during the second and third years after their return from Vietnam.

As figure 1 shows, social class was unimportant in predicting drug use in veterans, as it had been in studies of students. On the other hand, other demographic variables, including growing up in an inner city, being black, and entering the service at a very young age were all related to drug use. Early drug use, that is, before the age at which they entered service (i.e., age 18 or younger), also predicted

FIGURE 1.—*Preservice predictors of any illicit drug use by veterans 1973-1974*



From D.E. Smith, S.M. Anderson, M. Buxton, N. Gottlieb, W. Harvey, and T. Chung, eds., A Multicultural View of Drug Abuse--Proceedings of the National Drug Abuse Conference,1977,p.77. (Cambridge, Mass.: Hall/Schenkman, 1978). Copyright © 1978. Reprinted with permission of the publisher.

drug use at ages 23 and 24. The best predictor of all was deviant behavior before service. The deviant behavior scale was made up of five behaviors: truanting, expulsion or dropping out of high school, getting arrested, fighting, and getting drunk before age 15. We combined the predictive variables--demographic, drug use, and deviance--into what we called a "youthful liability scale." This scale did an excellent job of predicting drug use. We also found that it did very well for nonveterans in the same age period.

Our study confirmed the findings of school studies that broken homes and parental alcoholism and drug use predicted veterans' drug use. However, we found that these family variables added nothing to our "youthful liability scale." Apparently coming from this kind of family helped to explain the preservice deviance and early exposure to drugs which in turn predicted drug use in the twenties, but it had no direct effect on drug use at that age.

We found very little else that was predictive of drug abuse in the twenties, although those who had seen a doctor for a nervous or mental difficulty before going into service and who had not worked full time had somewhat increased rates of drug use.

The youthful liability scale predicted use of each of the drugs studied. We studied use of four major types of drugs: marijuana, amphetamines, barbiturates, and heroin. Heroin users had a higher youthful liability score than did users of any other class of drugs. For drugs other than heroin, increased scale scores were associated with a greater frequency of use, but among heroin users, there was no variation by frequency. Use of heroin at any level was associated with a very high score.

There have now been a large number of studies showing that illicit drug use typically starts with marijuana, and that approximately one-half of the marijuana users then try some other drug. If there is only one drug that is going to be used, it is almost always marijuana. This is true in almost every study that we have seen, including the Vietnam veterans. When veterans used a single drug, it was marijuana in nine out of ten cases. Since marijuana is typically the first drug of abuse, it has been called "the stepping stone to drug addiction." This nomination has raised endless discussion as to whether marijuana use "causes" the use of other drugs. Those who say "no" point to the half who use marijuana and never go on to anything else. Those who say "yes" point to the fact that the use of other drugs rarely occurs in the absence of marijuana use. At present marijuana use seems to be a necessary but not a sufficient condition for the progression to other drugs.

The "stepping stone" hypothesis is clearly wrong if it is taken to imply that when marijuana users go on to other drugs, they drop their use of marijuana. In our experience and that of most other studies, it appears that as new drugs are tried, the drug repertoire grows, rather than experiencing the displacement of one drug by another. Use of the less popular drugs, therefore, implies the use of many drugs. Among both our veterans and our nonveterans, there is a strong negative correlation between the frequency with which a particular drug is used and the number of other drugs used during the same time period.

Those marijuana users who go on to other drugs are almost exclusively those who have used marijuana frequently and who began its use early. Most Vietnam veterans who used marijuana several times a week used other drugs as well. Most of those who used marijuana more rarely used nothing else. There is also the fact that the earlier marijuana is used, the more likely it is that there will be other drugs used as well. Marijuana use beginning at age 20 or later in our sample of young black men (Robins and Murphy 1967) was typically infrequent, mild, and involved use of no other drugs at all.

Heroin is a drug that is used infrequently, and thus heroin users typically use many other drugs as well. This phenomenon may have contributed to heroin's reputation as an especially dangerous drug. To find out whether heroin's bad name is largely explained by its place late in the sequence of adding new drugs, we compared on a number of adult variables the outcomes of veterans who used heroin with the outcomes of other veterans, holding constant the number of other drugs used at all, specific other drugs used regularly, and their youthful liability scale scores, since this scale predicted general adjustment as well as drug use. When we controlled on these factors, we found that heroin use was associated with an increase in adjustment problems such as crime, alcoholism, violence, unemployment, and marital breakup, but the increase in such problems accounted for by heroin was no greater than the increase accounted for by the use of amphetamines or barbiturates, similarly studied. Thus the especially bad reputation of heroin seems due more to the kinds of people who use it and the large number of other drugs they use along with it than to properties of the drug itself.

INTERPRETING THE RESULTS

So far, I have tried to describe what we know about the natural history of drug abuse up to the point of addiction, with due recognition that this description is very much a product of one historical era, and that there is variation by location, population, and availability of the drugs even within this era. There are important subpopulations of abusers, such as those overusing prescribed drugs and drug-abusing doctors and nurses that I have not included here at all, in part because they have not been as fully studied.

To summarize these findings, we find that drug use occurs disproportionately in young people with average or better than average IQs, who come from minority groups, are urban, who have disaffection for school, and who are critical of the conventional social mores of their times; that the earlier drug use begins, the more serious it is; that use typically progresses along quite easily describable lines, beginning with marijuana use, which in itself is predicted by the use of alcohol and cigarettes; and that those who become frequent and heavy marijuana users have a greatly increased liability of progression to other drugs, although they do not give up the use of marijuana as they add new drugs. We have also found that many of the reported characteristics of heroin do not really seem to be distinctive. Heroin of the quality recently available on the street does not seem to differ from other drugs in its liability to frequent use or daily use, although regular users of it do more often perceive themselves as dependent than do users of other drugs, even though they seem able to give it up as readily. To what extent their opinion reflects heroin's bad reputation rather than their personal experience of craving is hard to say.

Having described the natural history of drug abuse in the United States in the 1970s, there remains the difficult issue of trying to understand the implications of these findings. Is drug abuse simply one part of the general pattern of deviant behavior that we call "conduct disorder" when it occurs in children and "antisocial personality" when it occurs in adults? Or is it simply one expression of adolescent rebellion and deviance among many others? If so, then what we describe as the "natural history of drug abuse" may have little to do with effects of exposure to drugs but may instead be a description of the course of development of juvenile deviance or adolescent rebellion. The progression to the use of a variety of drugs and then the consequent withdrawal from drug use may parallel the general pattern of development of adolescent deviance, followed by a decline in deviance with maturation. To throw some light on that question, we first need to say what the characteristic pattern of development of adolescent deviance is and how closely drug abuse follows the same pattern.

In an earlier study (Robins 1966) exploring the development of the antisocial personality, we discovered that it is primarily a male phenomenon, that it usually begins in the early school years with school failure and truancy, progresses by adolescence into drinking excessively, dropping out of school, and delinquency. Our study and other studies of delinquents find their typical IQ score to be slightly below normal, usually in the low 90s. There seems to be some association with minority group membership. Parents of deviant children often have a history of antisocial behavior themselves, particularly of excessive drinking and crime. Childhood deviance encompasses a variety of juvenile problem behaviors which are all highly intercorrelated, and each is independently correlated with each of the adult behaviors that are part of antisocial personality (Robins 1978). No single childhood behavior appears necessary to the development of antisocial personality, and the *variety* of childhood deviant behaviors is a better predictor than is the occurrence of any specific type of behavior. The typical adult antisocial pattern includes chronic unemployment, marital breakup, multiple arrests, excessive drinking, and irresponsibility toward sexual partners and children. Like the childhood behaviors, these adult outcomes are highly intercorrelated. Often they terminate in middle age.

Can we see drug abuse as part of this general process? Clearly there are both differences and similarities. Occasional or mild drug use seems clearly *not* to be part of the antisocial personality. It encompasses too large a proportion of youth, and has few adverse consequences. While more serious abuse of drugs resembles general adolescent deviance in its concentration in urban male minority groups from broken homes and its association with adolescent delinquency, school dropout, and early drinking, it does not occur disproportionately in persons from impoverished families or in children with lower than average IQs, or in those with *early* school failure and truancy. Its sex distribution is not so one-sided as is the distribution of delinquency or adult antisocial personality.

In adolescence and adult life, the correlates of serious drug abuse are very similar to those of antisocial personality. Those who use drugs heavily have higher than expected rates of adult arrest, unemployment, marital breakup, alcohol problems, and child neglect. Drug abusers often seem to improve with aging, as do those with antisocial personality, although their recovery may well be earlier--probably between 25 and 30 rather than in the fourth decade. Further, those young people who have the predictors and course typical of antisocial personality are indeed likely to abuse illicit drugs, just as they tend to smoke and drink more than average.

Thus the present picture is a confusing one. Certainly there is some overlap between antisocial personality and serious drug abuse, but there are also striking differences. The most reasonable position at the present time seems to be that drug abuse can be part of antisocial personality, but that most drug abusers probably do not have that syndrome, since the typical drug abuser is so different in terms of IQ, social class, history of elementary school problems, and very early termination.

The fact that the preuse history of drug abusers is more favorable than that of persons with antisocial personality, and yet the adult outcomes are often equally disastrous, leaves us with the possibility that it is exposure to drugs itself that may be harmful, in addition to any underlying effects of the predisposition of the drug user. While this is an important concern, the good recovery of Vietnam veterans shows that any harm that the drugs may engender need not be permanent or irreversible, if the supply of drugs again contracts. I am afraid that the implications of these findings are that we must continue to rely on supply control as a chief preventive measure, until we can provide some other explanation for the adverse outcomes of those who become frequent users of illicit drugs.

A Theory of Drug Dependence Based on Role, Access to, and Attitudes Toward Drugs

Charles Winick, Ph.D.

Why is a theory of drug dependence needed? Most theories help us to understand a specific situation or substance. But we now find dependence on a wide range of substances among so many different groups and even countries that a heuristic theory must improve our ability to understand the whole spectrum of dependence. With the continuing development of new substances of dependence, it seems foolhardy to develop a theory of drug dependence that is linked to any one chemical. Dependence involves taking a substance over a specific period of time at a specific minimal rate; the time and rate needed for dependence vary with the substance. We generally follow the World Health Organization definition of dependence as a state of psychic or physical dependence, or both, on a drug, arising in a person following administration of that drug on a periodic or continuous basis (Eddy et al. 1965).

Any proposed theory should explain the differential incidence of drug dependence on population subgroups in a manner which does not rely on individual personality factors. The large number of different kinds of people who have become drug dependent makes it unlikely that they share specific personality traits. Where such personality traits have been identified, they usually apply to a wide range of activities and do not explain why persons with such traits become drug dependent rather than, for example, join a chess club, although both drug dependents and chess players may share the same personality characteristics (Winick 1957).

Our three-pronged theory suggests that the incidence of drug dependence will be high in those groups in which there is--

1. Access to dependence-producing substances;
2. Disengagement from proscriptions against their use; and
3. Role strain and/or role deprivation.

A role is a set of expectations and behaviors associated with a specific position in a social system. A role strain is a felt difficulty in meeting the obligations of a role. By role deprivation, we mean the reaction to the termination of a significant role relationship.

A role approach can help to minimize fruitless debates over whether one specific factor is more important than another in the genesis of drug dependence, because role is a sufficiently dynamic concept to subsume a number of other dimensions. The role approach is consonant with modern medical thinking about the effect of stress on genesis of disease and the integration of concepts of psychosomatic disease. Medicine is moving away from allopathic treatment as it integrates the public health view of the person functioning in a specific environment.

Instead of having to say that people become drug dependent in order to meet their personality needs, we are suggesting that it is possible to locate the structural sources of role strain and deprivation within the social system. We hypothesize that all points of taking on new roles or all points of being tested for adequacy in a role are likely to be related to role strain and thus to a greater incidence of drug dependence in a group. We also hypothesize that incompatible demands within one role, such as between two roles in the same role set, are likely to lead to a greater incidence of drug dependence. The amount of role strain is a function of various factors, so that the larger the volume of properties of a role set, the greater the potential for strain.

Role strain is positively correlated with the ambiguity of role obligations (Snoek 1966), the inconsistency of role obligations, the distribution of power and interest within the role set, the visibility of different roles within the role set, and the kind of conformity (attitudinal, behavioral, doctrinal) required by different roles within the role set (Coser 1961).

The three prongs of the theory which are outlined above deal with the genesis of dependence and are relevant to the use of psychoactive substances such as marijuana, LSD, amphetamines, barbiturates, peyote, and opiates.

One clear application of the theory is to persons whose drug of choice is heroin. Heroin users are likely to be persons whose substance use is overdetermined and who have a multiplicity of problems and difficulties, whereas users of other substances are more likely to take them for specific problems (Blum and Associates 1969). Heroin users are therefore persons who are especially likely to experience role difficulties. Because of its history in this country, heroin is typically regarded with caution by most people and access to it is not easy.

Once we have located the sources of role strain in a society, we can specify those role situations which are likely to show a high incidence of drug dependence. It ought to be possible for us to identify positions in the social structure which are more vulnerable than others to role strain and/or role deprivation. We can also cite role sets within a status which tend to place a person in a structural position of increased strain.

A theory of drug dependence should enable us to predict (1) which subgroups in a population will be most likely to become dependent and (2) which individuals in a subgroup will be most likely to become dependent. There are always many people who are at risk and who are recreational or experimental users but who do not become drug dependent. A valid theory should help to explain such occurrences, without relying on tenuous personality characteristics which may be reflecting drug use rather than contributing to its etiology.

This theory has the merit of explaining the genesis and continuation of drug dependence when there is an endemic situation, such as prevailed in the United States in the 1940s and 1950s, and when we could expect that there will be fairly identifiable characteristics of those who get involved with drugs. It also can clarify the genesis and continuation of drug dependence if there is an epidemic or even a pandemic, as prevailed in the late 1960s, and when so many people are becoming dependent that there is a much broader base of persons at risk.

The theory helps to clarify the initiation of use and its continuation and expansion into dependence. To the extent that all three prongs of the theory are met, there will be a greater likelihood of use merging into dependence. If only two prongs are met, there will be a lesser likelihood of a user becoming dependent. The threshold to dependence is more likely to be crossed when all three prongs are operative.

In terms of the proposed theory, addiction is regarded as one type of dependence, and there would seem to be no need for a special theory of addiction. The relatively diluted street drugs available in the last 15 years make addiction a less significant dimension of dependence than was the case in the 1930s. Also, the widespread dependence on physiologically nonaddicting substances like marijuana and cocaine and the prevalence of polydependence would appear to have made addiction less important in the large drug "scene."

The theory regards drug abuse as another dimension of drug dependence. Although the notion of abuse may have relevance to legislative, public relations, or funding considerations, it does not seem necessary as an explanatory variable.

SOME APPLICATIONS OF THE THEORY IN AMERICA

In order to get a direct test of the predictive ability of our theory, we developed a role inventory for adolescents. There is good reason to expect that the adolescent years will be heavily complicated because of the ambiguity of the status of adolescents in our society, who have lost the role of children but are not yet able to assume an adult role. The 20 items in the inventory measure three dimensions of the adolescent role:

1. The adolescent's ability to handle the options and possibilities, real and imaginary, open to him or her.

2. Positioning oneself among one's peers.

3. Handling the changes in one's body.

Each subject also answered a number of questions about family, school, lifestyle, eating and drinking habits, and degree of use of a variety of psychoactive substances (Winick 1974c).

This role inventory was administered to 1,311 high school juniors in the metropolitan New York area. Juniors were used because they would be unlikely to have the role-adjustment problems of either graduating seniors or entering students.

Scores on the role inventory were translated into a maximum of 100, with a relatively high score indicating comfort and a minimum of role conflict and/or deprivation. The students in the lowest quartile of the role inventory were regarded, in terms of our theory, as high risks in terms of use of marijuana; the other three-fourths of the students were considered low risks. We found that the proportion of high-risk adolescents using marijuana at least once a week or more for at least four weeks during the preceding year was 11 percent. However, only two percent of the low-risk group had used marijuana once weekly or more for at least four weeks during the preceding year; the difference between the two groups was statistically significant ($X^2=49$, df=1, $p < 0.001$).

In addition to such specific tests of the theory, we can infer the presence in drug-dependent persons of such role variables from secondary analysis of data collected for other purposes. For example, although the age at which a young person is allowed to work varies from State to State, we find that almost without exception it is an age at which there is a peak incidence of new cases of drug dependence (U.S. Department of Labor 1966). Thus, in New York, where the young person may leave school and begin working at 16, the age of 16 has long been the age at which one is most susceptible to beginning regular use of heroin. At the time when glue sniffing was a serious problem, the incidence of glue sniffing was highest among youngsters leaving sixth grade and entering junior high school (Winick and Goldstein 1965). Comparable 12-year-olds who were in an eight-year elementary school displayed far less glue sniffing.

Johnston (1973), in one of the very few studies to follow a large (2,200) sample of adolescent males for some years, found that there was a clear and positive relationship between negative attitudes toward the Vietnam war, negative attitudes toward government, and the use of marijuana, hallucinogens, and amphetamines. We can interpret negative attitudes toward the war and government as dimensions of role strain. Seven out of ten of the respondents said they thought marijuana would be easy to obtain. Proscriptions against drug use are less salient among young people than among other groups.

Many other existing studies of drug dependence among young people can be constructively interpreted in terms of our theory of role strain/deprivation, access, and attitudes. These include studies of delinquents (Cloward and Ohlin 1960); Chicago heroin addicts (Finestone 1957); Colorado marijuana users (Jessor and Jessor 1973); and New York City addicts (Chein et al. 1964). If we look at these studies, the data they provide are compatible with our theory, although all these studies were conducted independently of our theory.

A large-scale study of the life cycle of addiction concluded that its genesis was concentrated during the years of late adolescence and early adulthood because of the role strain stemming from decisions about sex, adult responsibility, social relationships, family situations, school, and work, as well as from role deprivation resulting from the loss of familiar patterns of behavior (Winick 1964).

There are many potentially hazardous consequences of role discontinuity and a lack of order and sequence in the cultural training of a person moving along a life cycle (Benedict 1938). Americans have increasingly been deprived of significant role-related ritual experiences that help in the achievement of an emotional state that could bridge the gap between old and new. The role-related ritual helped to give meaning to the conclusion of one phase of the life cycle and the commencement of another, providing a sense of community and publicly affirming the subject's social and personal identity and the move from one age and status group to another. As modern American rites of passage have become more subdued, people have had a lesser role identity and less opportunity to develop a sense of self. Insufficiently graded sequences of role positions through which people move may be dysfunctional and could be related to the onset of drug dependence (Winick 1968).

STUDIES OF SPECIAL GROUPS

It is possible to apply our theory to a variety of special groups which have had a high incidence of drug dependence: Native Americans, soldiers in Vietnam, college students, jazz musicians, physicians, and nurses.

NATIVE AMERICANS

A study of Menomini Indians concluded that the members of a tribe most drawn to peyote had difficulty in developing role relationships either with the tribe or the world outside (Spindler 1952).

SOLDIERS IN VIETNAM

Another situation providing data relevant for our theory can be derived by analysis of the experience of the American troops in Vietnam. A study of Army enlisted men in Vietnam concluded that approximately 35 percent of this group tried heroin at least once during their "hitch." Fully 20 percent of the troops were "strung out," or dependent on the drug during their year of service (Robins 1973). While serving in Vietnam, the soldiers had (1) access to heroin, which was cheap and freely available; (2) disengagement from negative proscriptions about its use because many of the natives as well as other soldiers were already using it; and (3) severe role strain because of boredom, homesickness, uneasiness, the ambiguity of our role in Vietnam, the lack of a clearly defined "front," and the enormous opposition to the war in the United States, all of which combined to make the strain so severe that tours of duty there were limited to one year.

COLLEGE STUDENTS

There are a number of studies of drug use among college students which, although they were conducted for other purposes, lend themselves to interpretation in terms of our theory. Certainly at many colleges there is a high degree of access to drugs and emancipated attitudes toward their use, which means that two of our three conditions are met. Drug use is favored by those students, we would argue, who are experiencing role strain and/or role deprivation. Among the contributors to role strain among the young are the current confusion over the masculine and feminine roles, the decline in clothing as an indicator of age-graded role expectations, the role competitiveness induced by the large numbers of young people seeking similar goals, disillusion about conventional roles, loss of positive role models in mass media, and consideration of the notion that many of our role models in public life are less than admirable (Winick 1973).

Suchman (1968), in a survey of a large West Coast university, found that marijuana use was correlated positively with reading underground newspapers, negative reactions to education, respect for the "hippie" way of life, approval of "getting around" the law, and other dimensions of a "hang loose" ethic, which we can interpret as a special case of the larger phenomenon of role strain.

In a survey of almost 8,000 college students throughout the country, Groves (1974) found a positive correlation between marijuana, psychedelics, opium, and methamphetamine use and counterculture attitudes. The latter may be interpreted as reflections of what we would consider role strain.

The recurrent finding that the incidence of drug dependence and use is higher among liberal arts than engineering students and higher among undergraduates than graduate students can be interpreted in terms of role theory (Marra 1967). The liberal arts and undergraduate students are less explicitly role oriented and experience more role strain than the engineer-to-be or graduate student, who has made a career commitment which she or he is pursuing with a certain degree of awareness of what lies ahead.

Similarly, the finding that drug use is more common among students living off campus and not with their families than among dormitory residents or students living with their families can be understood in terms of the greater role strain to which the off-campus students are subjected (McKenzie 1969).

MUSICIANS

The theory has helped to explain the genesis and continuation of drug dependence among jazz musicians (Winick 1960, 1961b, 1962b). Jazz musicians tend to have liberated attitudes toward drugs, and they often perform in places where drugs are freely available. The occupation involves massive role strain, because of uncertainty over employment, the need for improvisation, and continually changing musical styles. Drug dependence among jazz musicians has consistently peaked at times when role deprivation threatened performers, such as the transition from Dixieland to swing (1930-35), from swing to bop (1945-49), and from jazz to rock (1954-58). Musicians who became drug users tended to be those who felt threatened by the shift from one kind of music to another. The same kind of phenomenon could be found among rock musicians as they moved from rhythm and blues (1955-57) to the British sound in the early 1960s to folk rock (1965-67) to hard rock (1970-71) and "crossover" music (1977-78).

PHYSICIANS

Physicians have long been identified as an occupational group with a high rate of drug dependence (Winick 1961a). Physicians have access to drugs of dependence and tend to have emancipated attitudes toward their use. Physicians who become dependent may even have magical or omnipotent attitudes toward drugs. ("Because I am a doctor, I will know when to stop.")

Interview studies with 315 drug-dependent physicians concluded that medical specialties which traditionally involve considerable role strain, such as psychiatry and surgery, have a disproportionately high rate of drug dependence. Also overrepresented among addicted physicians are those in career contingencies that are likely to produce role strain: last year of residency, year before taking board examinations, inability to handle overwork, conflict between a humanitarian and entrepreneurship view of medicine, ambivalence about being a physician, and conflict between demands of the profession and of a spouse. Role deprivation figures in another group of addict physicians, those who are moving from one type of practice to another, failing specialty boards, moving their office, leaving one specialty for another, facing retirement, or are concerned about the effect of illness or their ability to practice.

NURSES

About one percent of the approximately 650,000 American nurses are drug dependent. Nurses have access to drugs because they administer them to patients and control their use in hospitals. They are relatively emancipated in terms of attitudes toward their use because of familiarity with their analgesic properties. In an interview study of 195 drug-dependent nurses, role strain and deprivation were significant contributors to the beginning of the dependence (Winick 1974a). Among the role strain factors which emerged were extreme fatigue, physical ailments making for work difficulties, quarrels with coworkers, disagreements between the nurse's conception of her job and urgencies of the work situation, conflict between demands of a family situation and the job, and pressures arising from conflicting demands of the nurse's role. Among the role deprivation factors found in the drug-dependent nurses were uneasiness about leaving bedside nursing for a promotion to supervisor, the loss of a significant personal relationship (via death, a child moving out, or divorce), facing retirement, or leaving a familiar situation.

FOREIGN EPIDEMICS

The theory has been successfully used to clarify the reasons for a huge increase in drug dependence in the three countries which have experienced the most thoroughly documented post-World War II epidemics: Japan, Switzerland, and Sweden.

The amphetamine epidemic which swept Japan between 1945 and 1955 and involved more than 2,000,000 people centered on groups such as artists, Korean emigres, young male delinquents, and economically marginal persons who had been dislocated from their jobs and other moorings by post-War social change (Brill and Hirose 1969). We suggest that such persons were responding to role strain and/or deprivation. In Japan, methamphetamine was available without prescription in 1945 in large quantities. The drugs were promoted actively for their mood-elevating properties by manufacturers. The situation in Japan meets the three criteria of access, freedom from negative proscriptions, and role strain and/or deprivation. The groups that did become drug dependent were usually vulnerable to role strain and/or deprivation.

Soon after World War II, drug dependence to analgesic compounds containing phenacetin, caffeine, and a hypnotic drug became a severe problem in the German-speaking part of Switzerland (Kielholz and Battegay 1963). Some 80 percent of these cases were women who tended to fall into two groups: working housewives experiencing role strain because of the multiple demands posed by their jobs, housework, and raising children, and single women who experienced role deprivation as a result of moving into urban areas from the country in order to become piecework employees of the watch and textile factories. In communities with such factories, about one percent of the population was dependent on these substances. Because Switzerland is the home of some of the world's largest pharmaceutical manufacturers, the analgesic substances were not only easily available but were advertised as harmless. All three elements of our theory are relevant to the Swiss situation.

A third foreign example is provided by Sweden, which had some 200,000 amphetamine users around 1959, when widespread nonmedical use of various amphetamines began (Goldberg 1968). The users tended to be single or divorced adults, from homes where the parents were divorced (41 percent as against three percent in the normal population); nomadic and disaffected youths; and others whose life situations posed problems of role strain or deprivation. There was relative acceptance of amphetamines, which were easily available. All three prongs of our theory are relevant to the Swedish epidemic.

CESSATION OF DRUG DEPENDENCE

The theory suggests that a population or subgroup will tend to cease drug dependence when (1) access to the substances declines, (2) negative attitudes to their use become salient, and (3) role strain and/or deprivation are less prevalent. If all three of these trends are operative, the rate of drug dependence will decline more rapidly than if only one or two trends are relevant.

Several examples illustrate the dynamics of cessation. Of the large number of soldiers who were addicted in Vietnam, only seven percent have been addicted at any time since their return to America (Robins 1973).

If we explain the genesis of the relatively high rate of Vietnam heroin use in terms of our theory, can we use the same theory to explain its relative nonresumption by the soliders? Yes, because when they returned to this country, the soldiers came to a situation in which (1) a major law enforcement effort had made drugs relatively inaccessible and expensive, (2) there was a strong feeling of disapproval of heroin and growing acceptance of the negative proscriptions about it, and (3) less role strain because the soldiers were out of Vietnam and usually no longer in uniform.

Perhaps the single most successful treatment program for drug addicts, in terms of recovery rates, was the Musicians' Clinic (Winick and Nyswander 1961). One reason that it was so successful is that it faced and dealt with the musicians' role conflicts about their work. The very existence of the clinic, which was widely publicized, also contributed to an atmosphere in which musicians' attitudes toward drug use became less accepting.

In Japan, the drug epidemic ended in a few years because when the dangers of the situation became clear, Japanese authorities acted decisively to control the availiability of amphetamines, change attitudes toward their use, and assist those users who needed treatment. The enormous boom in the Japanese economy and the stabilization of the society further helped to minimize role dislocations and, thus, in terms of our hypothesis, proneness to drug dependence.

Similarly, in Switzerland, the drug epidemic ended in the 1960s because the Swiss acted to educate the public on the possible hazards of these substances, made access to them more difficult, and provided treatment for those already afflicted. The education and treatment effort was quite successful for a number of reasons, one of which was that the role conflicts of the high-risk population were faced.

Because the Swedish Government has done little to deal with the availability of drugs, favorable attitudes toward their use, or role conflicts among its population, drug dependence still continues there as a severe problem.

RELAPSE

Here or abroad, a person may, of course, cease drug dependence, stop using for some period of time, and then relapse. The reasons for relapse, in terms of this theory, would reflect the person's inability to sustain the role of the nonuser. Each period of abstinence may represent a trying out of the nonuser's role. It is likely that the most common pattern of cessation of drug dependence involves experimentation with the nonuser's role until it is consonant with other aspects of the person's life.

An earlier formulation of the theory argued that drug-dependent persons "matured out" when there was a lessening of the role pressures which had led to the beginning of regular drug use (Winick 1962a). The process of "maturing out" was slow and typically involved a stop-start pattern of drug use until the person felt comfortable with the role of the nonuser. This was the most frequently found manner of cessation of drug dependence, and there is reason to believe that it is still the most prevalent form of termination of regular drug use.

In the original study which led to the formulation of the "maturing out" theory, based on a national sample, the mean age of "maturing out" was 35 (Winick 1962a). A study of Puerto Ricans who were dependent on opiates concluded that those who "matured out" did so at the mean age of 33 (Ball and Snarr 1969). An analysis of the phenomenon in New York City concluded that persons listed in the Narcotics Register who "matured out" did so at a mean age of 34 (Snow 1974). This narrow clustering of age at "maturing out" in different samples at different times suggests that there are underlying regularities in the process. Ethnicity, sex, residence, access to and salience of drugs, attitudes toward drugs in an area, and the extent to which nondrug-related roles are plausible and reinforced, contribute to cessation of drug use, as does the extent to which the user experiences less role strain and/or deprivation.

LINKAGES WITH OTHER PROBLEM BEHAVIOR

The drug-dependent person may or may not be involved with other social problem behavior, such as crime. In recent years, a substantial proportion of those who become drug dependent have also been involved with a larger pattern of deviant activity, over and above their illegal purchase of drugs. During the 1950s, such a pattern was less common.

The relationship between drug use and other forms of deviance is a function of socioeconomic status, life changes, anchorages in the "square" culture, a person's place in the life cycle, and many other factors. Drugs serve many different purposes for people, and these purposes contribute substantially to whether or not the use is part of a larger antisocial stance.

NEGATIVE CASES

A theory should be able to explain negative cases, and we can use our theory to explain why Army officers serving in Vietnam were virtually uninvolved with heroin. In terms of the three prongs of our theory, Army officers were (1) easily able to get heroin, (2) accepting of the conventional negative proscriptions about its use because most were careerists for whom a heroin record would have meant a serious setback to their futures, and (3) relatively unlikely to experience role strain because they were generally volunteers and Vietnam service was almost a prerequisite for rapid promotion and desirable staff assignments. Therefore, two of the three requirements of our theory were not met, and it is not surprising that Army officers largely ignored the availability of heroin, whereas enlisted men were far less likely to do so.

The low rate of drug dependence among pharmacists and veterinarians may be explained by the relative lack of role strain among them, even though they have easy access to drugs and have few negative proscriptions about them. Similarly, there is hardly any drug dependence among certain medical specialties, such as dermatology and radiology, for related reasons. Dermatologists and radiologists have relatively routinized practices, with few of the stresses of the psychiatrist or the peaks and valleys of the surgeon. A number of other negative cases have been developed.

ADVANTAGES OF THE THEORY

The proposed theory has the merit of parsimony and applicability to a broad range of situations, cultures, and persons. It can help to explain and clarify an unfolding or developing situation and predict an upcoming problem. It appears relevant to practically all instances of drug dependence except for those which are iatrogenic. The theory also has direct implications for therapy and public health. It lends itself to operational definitions and combines consideration of the realities of availability and the marketplace, attitudinal dimensions, and the central dimension of role (Winick 1974b). The theory may shed light on historical situations, current populations, and it possesses predictive value.

It lends itself to many different policy and planning purposes, shedding light on rates of drug dependence in the general population and among special groups. It is practical in the sense that Paul F. Lazarsfeld meant when he said that there is little that is as practical as a good theory.

The most reasonable way to deal with drug dependence is an effective program of prevention. We can identify role strain or deprivation situations and pay special attention to methods of handling the associated problems. Assuming that society continues the prevalent view that drug dependence is undesirable, it should be possible to anticipate situations likely to be related to high rates of drug dependence and to act in order to deal appropriately with them. Concentration on high-risk groups which can be identified as such in terms of role can help to minimize the hazards of gearing our community programs to specific substances.

The Social Setting as a Control Mechanism in Intoxicant Use

Norman E. Zinberg, M.D.

An individual's decision to use an intoxicant, the effects it has on the user, and the ongoing psychological and social implications of that use depend not only on the pharmaceutical properties of the intoxicant (the drug) and the attitudes and personality of the user (the set), but also on the physical and social setting in which such use takes place (Huxley 1970; Weil 1972; Zinberg and Robertson 1972). This theoretical position has been so widely accepted in the last two years as to become almost a truism, but, though lip service is paid to the importance of all three variables (drug, set, and setting), the influence of the setting on intoxicant use and on the user is still little understood (Zinberg and DeLong 1974; Zinberg et al. 1975).

Even those who make use of this theoretical construct in analyzing the patterns of drug use and treating users fail to realize the important role played by the setting (both physical and social) as an independent variable in determining the impact of use. When a drug is administered in a hospital setting, for example, the effect is very different from that experienced by a few people sitting around in a living room listening to records. Not only is there a vast difference between the actual physical locations, but different social attitudes are involved. In the hospital, the administration of opiates subsumes the concepts of institutional structure of therapy and licitness. In the living room, there is a flavor of dangerous adventure, antisocial activity, illicit pleasure, and the considerable anxiety that accompanies all three. Considering these differences, it is not surprising that few patients in hospital settings experience continued drug involvement after its therapeutic necessity is past (O'Brien 1978; Zinberg 1974a), while many of the living-room users express an intense and continued interest in the drug experience.

The role of the setting continues to be minimized because of the greater preoccupation either with the pharmaceutical properties, with the personal health hazards of the drug itself, or with the personality deterioration of those who have not been able to control their use (Zinberg 1975; Zinberg and Harding 1979). These preoccupations obscure from the scientific community, as well as from the public, the precise ways in which the setting influences both use itself and the effects of use, acting either in a positive way to help to regulate use or in a negative way to weaken control.

This paper defines the mechanisms of control developed within the social setting, which I call social sanctions and rituals, and the theory behind their operation. Then it discusses and gives illustrations of the process of social learning by which these mechanisms become active in controlling use.

SOCIAL CONTROLS--SANCTIONS AND RITUALS

Social sanctions are the norms defining whether and how a particular drug should be used. They include both the informal (and often unspoken) values and rules of conduct shared by a group and the formal laws and policies regulating drug use (Zinberg et al. 1977; Maloff et al. 1979). For example, two of the sanctions or basic rules of conduct that regulate the use of our culture's favorite drug, alcohol, are "Know your limit" and "Don't drive when you're drunk." Social rituals are the stylized, prescribed behavior patterns surrounding the use of a drug. These patterns of behavior may apply to the methods of procuring and administering the drug, the selection of the physical and social setting for use, the activities undertaken after the drug has been administered, and the ways of preventing untoward drug effects. Rituals thus serve to buttress, reinforce, and symbolize the sanctions. In the case of alcohol, for example, the statement "Let's have a drink," by using the singular term "a drink," automatically exerts control.

Social controls (rituals and sanctions), which apply to all drugs, not just alcohol, operate in different social contexts, ranging all the way from very large social groups, representative of the culture as a whole, down to small, discrete groups (Harding and Zinberg 1977). Certain types of special-occasion use involving large groups of people--beer at ball games, drugs at rock concerts, wine with meals, cocktails at six--despite their cultural diversity, have become so generally accepted that few, if any, legal strictures are applied even if such uses technically break the law. For example, a policeman will usually tell young people with beer cans at an open-air concert "to knock it off" but will rarely arrest them, and in many States the poice reaction would be the same even if the drug were marijuana (Newmeyer and Johnson 1979). The culture as a whole can inculcate a widespread social ritual so thoroughly that it is eventually written into law, just as the socially developed mechanism of the morning coffee break has been legally incorporated into union contracts. The T.G.I.F. (Thank Goodness It's Friday) drink may not be far from acquiring a similar status. Small-group sanctions and rituals tend to be more diverse and more closely related to circumstances. Nonetheless, some caveats may be just as firmly upheld, such as: "Never smoke marijuana until after the children are asleep," "Only drink on weekends," "Don't shoot up until the last person has arrived and the doors are locked."

The existence of social sanctions or rituals does not necessarily mean that they will be effective, nor does it mean that all sanctions or rituals were devised as mechanisms to aid control. "Booting" (the drawing of blood into and out of a syringe) by heroin addicts seemingly lends enchantment to the use of the needle and therefore opposes control. But it may once have served as a control mechanism which gradually became perverted or debased. Some old-time users, at least, have claimed that booting originated in the (erroneous) belief that by drawing blood in and out of the syringe, the user could tell the strength of the drug that was being injected.

More important than the question of whether the sanction or ritual was originally intended as a control mechanism is the way in which the user handles conflicts between sanctions. With illicit drugs, the most obvious conflict is that between formal and informal social controls, that is, between the law against use and the social group's condoning of use. The teenager attending a rock concert is often pressured into trying marijuana by his or her peers, who insist that smoking is acceptable at that particular time and place and will enhance the musical enjoyment. The push to use may include a control device, such as, "Since Joey won't smoke because he has a cold, he can drive," thereby honoring the "Don't drive after smoking" sanction. Nevertheless, the decision to use, so rationally presented, conflicts with the law and may make the user wonder whether the police will be benign in this instance. Such anxiety interferes with control. In order to deal with the conflict the user will probably come forth with more bravado, exhibitionism, paranoia, or antisocial feeling than would be the case if he or she had patronized one of the little bars set up alongside the concert hall for the selling of alcohol during intermission. It is this kind of mental conflict that makes control of illicit drugs more complex and difficult than the control of licit drugs across a wide range of personality types.

The existence and application of social controls, particularly in the case of illicit drugs, does not always lead to moderate, decorous use, and yet it is the reigning cultural belief that controlled use is or should be always moderate and decorous. This requirement of decorum is perhaps the chief reason why the power of the social setting to regulate intoxicant use has not been more fully recognized and exploited. The cultural view that the users of intoxicants should always behave properly stems from the moralistic attitudes toward such behavior that pervade our culture, attitudes that are almost as marked in the case of licit drugs as in the case of illicit drugs. Yet on some occasions--at a wedding celebration or during an adolescent's first experiment with drunkenness--less-than-decorous behavior is culturally acceptable. Though we should never condone the excessive use of intoxicants, it has to be recognized that when such boundary breaking occurs, it does not signify a breakdown of overall control. Unfortunately, these occasions of impropriety, particularly following the use of illicit drugs, are often taken by moralists to prove what they see as the ultimate truth: that in the area of drug use there are only two possible types of behavior--abstinence or unchecked excess leading to addiction. Despite massive evidence to the contrary, many people continue unshaken in this belief.

Such a stolid stance affects negatively the development of a rational understanding of controlled use. Two facts in particular are overlooked. First, the most severe alcoholics and addicts, who cluster at one end of the spectrum of drug use, do not use as much of the intoxicating substance as they could. Some aspects of control always operate. Remarkably few people--particularly some personality theorists who think inhibition against control stems from an actual defect in some aspect of personality (Zinberg 1975)--recognize this fact, however, because it is obscured by the appearance of great excess. Second, at the other end of the spectrum of drug use, as the careful interviewing of ordinary citizens has shown, highly controlled users and even abstainers express much more interest in and preoccupation with the use of intoxicants than is generally acknowledged. Whether to use, when, with whom, how much, how to explain why one does not use--these questions occupy an important place in the emotional life of almost every citizen. Yet hidden in the American culture lies a deep-seated aversion to acknowledge this preoccupation. As a result, our culture plays down the importance of the many social mores--sanctions and rituals--that enhance our capacity to control use. Thus the whole issue becomes muddled. Both the existence of control on the part of the most compulsive users and the interest in drugs and the quality of drug use (the questions of with whom, when, and how much to use) on the part of the most controlled users are ignored. We are left with longings for that utopian society where no one would need drugs either for their pleasant or for their unpleasant effects, either for relaxation and good fellowship or for escape and torpor.

But since such idealized abstinence is socially unacceptable and impossible, the culture's reigning model of extreme decorum overemphasizes the pharmaceutical powers of the drug or the personality of the user. It inculcates the view that only a disordered person would not live up to the cultural standard, or that the quantity or power of the drug is so great that the standard cannot be upheld. To think this way and thus to ignore the social setting requires considerable psychological legerdemain, for, as in most other areas of living, people can rarely remain indefinitely on so decorous a course. Intoxicant use tends to vary with one's time of life, status, and even geographical location. Many adolescents who have made heavy use of intoxicants slow down appreciably as they reach adulthood and change their social setting (their friends and circumstances), while some adults, as they become more successful, may increase their intoxicant use. A man born and bred in a dry part of Kansas may change his use significantly after a move to New York City. The effects on intoxicant use of such variations in social circumstances have certainly been perceived, but they are not usually incorporated into a sound theoretical understanding of how the social setting influences the use and control of intoxicants.

The history of the use of alcohol in America provides a striking example of the variability of intoxicant use and its control (Ade 1931; Bacon 1969). First, it illustrates the social prescriptions that define the social concept of control and, second, it shows that the time span of these control variations can be as long as a major historical epoch.

Five social prescriptions that define controlled or moderate use of alcohol--and these may apply to other intoxicants as well--have been derived from a study of alcohol use in many different cultures. All five of these conditions encourage moderation and discourage excess (Zinberg and Fraser 1979).

1. Group drinking is clearly differentiated from drunkenness and is associated with ritualistic or religious celebrations.

2. Drinking is associated with eating or ritualistic feasting.

3. Both of the sexes, as well as different generations, are included in the drinking situation, whether they drink or not.

4. Drinking is divorced from the individual effort to escape personal anxiety or difficult (even intolerable) social situations. Further, alcohol is not considered medicinally valuable.

5. Inappropriate behavior when drinking (violence, aggression, overt sexuality) is absolutely disapproved, and protection against such behavior is offered by the sober or the less intoxicated. This general acceptance of a concept of restraint usually indicates that drinking is only one of many activities and thus carries a low level of emotionalism. It also shows that drinking is not associated with a male or female "rite de passage" or sense of superiority.

The enormous changes in alcohol use that have occurred since the colonial period in America illustrate the importance of these social prescriptions in controlling the use of alcohol.

Pre-Revolutionary America, though veritably steeped in alcohol, strongly and effectively prohibited drunkenness. Families drank and ate together in taverns, and drinking was associated with celebrations and rituals. Tavernkeepers were people of status; keeping the peace and preventing excesses stemming from drunkenness were grave duties. Manliness or strength was measured neither by the extent of consumption nor by violent acts resulting from it. Pre-Revolutionary society, however, did not abide by all the prescriptions, for certain alcoholic beverages were viewed as medicines: "Groaning beer" was consumed in large quantities by pregnant and lactating women.

With the Revolutionary War, the industrial revolution, and the expansion of the frontier, an era of excess dawned. Men were separated from their families, which left them to drink together and with prostitutes. Alcohol was served without food, was not limited to special occasions, and violence resulting from drunkenness grew. In the face of increasing drunkenness and alcoholism, people began to believe (as is the case with some illicit drugs today) that it was the powerful, harmful pharmaceutical properties of the intoxicant itself that made controlled use remote or impossible.

The increase in moderation that appeared at the end of the nineteenth century was interrupted in the early 1900s by the Volstead Act, which ushered in another era of excess. We are still recovering from the speakeasy ambience of Prohibition in which men again drank together and often with prostitutes, food was replaced with alcohol, and the drinking experience was colored with illicitness and potential violence. Although repeal provided relief from excessive and unpopular legal control, the society was left floundering without an inherited set of social sanctions and rituals to control use.

SOCIAL LEARNING

Today this vacuum has been largely filled. In most sectors of our society, informal alcohol education is readily available. Few children grow up without an awareness of a wide range of behaviors associated with the use of alcohol, learned from that most pervasive of media, television. They see cocktail parties, wine at meals, beer at ball games, homes broken by drink, drunks whose lives are wrecked, and all the advertisements in which alcohol lends glamor to every occasion.

Buttressed by movies, the print media, observation of families and family friends, and often by a sip or watered-down taste of the grown-ups' portion, young people gain an early familiarity with alcohol. When, in a peer group, they begin to drink and even, as a rite of passage, to overdo it; they know what they are about and what the sanctions are. The process of finding a "limit" is a direct expression of "Know your limit." Once that sanction has been experientially internalized--and our culture provides mores of greater latitude for adolescents than for adults--they can move on to such sanctions as "It is unseemly to be drunk" and "It is all right to have a drink at the end of the day or a few beers on the way home from work, or in front of the television, but don't drink on the job" (Zinberg et al. 1977).

This general description of the learning or internalization of social sanctions, while neat and precise, does not take account of the variations from individual to individual that result from differences in personality, cultural background, and group affinity. Specific sanctions and rituals are developed and integrated in varying degrees with different groups (Edwards 1974). Certainly a New York child from a rich, sophisticated family, brought up on Saturday lunch with a divorced parent at The "21" Club, will use drinks in a different way from the small-town child who vividly remembers accompanying a parent to a sporting event where alcohol intake acted as fuel for the excitement of unambivalent partisanship. Yet one common denominator shared by young people from these very different social backgrounds is the sense that alcohol is used at special events and belongs to special places.

This kind of education about drug use is social learning, absorbed inchoately and unconsciously as part of the living experience (Zinberg 1974b). The learning process is impelled by an unstated and often unconscious recognition by young people that this is an area of emotional importance in American society, and, therefore, knowledge about it may be quite important in future social and personal development. Attempts to translate this informal process into the formal drug education courses, chiefly intended to discourage any use, of the late 1960s and early 1970s have failed. Formal education, paradoxically, has stimulated drug use on the part of many young people who were previously undecided, while confirming the fears of those who were already excessively concerned. Is it possible, one might ask, for formal education to codify social sanctions and rituals in a reasonable way for those who have somehow been bypassed by the informal process? Or, does the reigning cultural moralism, which has pervaded all such courses, preclude the possibility of discussing reasonable informal social controls that may, of course, condone use? So far, these questions remain unanswered. It will be impossible even to guess at the answers until our culture has accepted the use not only of alcohol but of other intoxicants sufficiently to allow teachers to explain how they can be used safely and well. Teaching safety is not intended to encourage use; its main focus is the prevention of abuse. Similarly, the primary purpose of the few good sex education courses in existence today is to teach the avoidance of unwanted pregnancy and venereal disease, not the encouragement or the avoidance of sexual activity per se.

Whatever happens to formal education in these areas, the natural process of social learning will inevitably go on, for better or worse. The power of this process is illustrated by two recent and extremely important social events: the use of psychedelics in the United States in the 1960s and the use of heroin during the Vietnam war.

Following the Timothy Leary "Tune In, Turn On, and Drop Out" slogan of 1963, the use of psychedelics became a subject of national hysteria--the "drug revolution." These drugs, known then as psychotomimetics (imitators of psychosis), were widely believed to be the cause of psychosis, suicide, and even murder (Mogar and Savage 1954; Robbins et al. 1967). Equally well publicized were the contentions that they could bring about spiritual rebirth, mystical oneness with the universe, and the like (Huxley 1970; Weil 1972). Certainly there were numerous cases of not merely transient but prolonged psychoses following the use of psychedelics. In the mid-sixties, psychiatric hospitals like the Massachusetts Mental Health Center and Bellevue were reporting as many as one-third of their admissions resulting from the ingestion of these drugs (Robbins et al. 1967). By the late sixties, however, the rate of such admissions had declined dramatically. Initially, many observers concluded that this decline was due to fear tactics--the warning about the various health hazards, the chromosome breaks and birth defects, which were reported in the newspapers. These stories proved later to be false. In fact, although psychedelic use continued to be the fastest growing drug use in American through 1973, the dysfunctional sequelae virtually disappeared (National Commission on Marihuana and Drug Abuse 1973). What then had changed?

It has been found that neither the drugs themselves nor the personalities of the users were the most prominent factors in those painful cases of the sixties. A retrospective study of the use of such drugs before the early sixties has revealed that although responses to the drugs varied widely, they included none of the horrible, highly publicized consequences of the mid-sixties. Another book, entitled LSD: Personality and Experience (Barr et al. 1972), describes a study of the influence of personality on psychedelic drug experience that was made before the drug revolution. It found typologies of response to the drugs but no one-to-one relationship between untoward reaction and emotional disturbance. And Howard S. Becker in his prophetic article of 1967 compared the then current anxiety about psychedelics to anxiety about marijuana in the late 1920s when several psychoses were reported. Becker hypothesized that the psychoses came not from the drug reactions themselves but from the secondary anxiety generated by unfamiliarity with the drug's effects and ballooned by media publicity. He suggested that such unpleasant reactions had disappeared when the effects of marijuana became more widely known, and he correctly predicted that the same things would happen with the psychedelics.

The power of social learning also brought about a change in the reactions of those who expected to gain insight and enlightenment from the use of psychedelics. Interviews have shown that the user of the early 1960s, with great hopes and fears and a sense of total unfamiliarity with what might happen, had a far more extreme experience than the user of the 1970s, who had been exposed to a decade of interest in psychedelic colors, music, and sensations. The later user, who might remark, "Oh, so that is what a psychedelic color looks like," had been thoroughly prepared, albeit unconsciously, for the experience and responded accordingly, within a middle range.

The second example of the enormous influence of the social setting and of social learning in determining the consequences of drug use comes from Vietnam. Current estimates indicate that at least 35 percent of enlisted men used heroin, and 54 percent of these became adicted to it (Robins et al. 1977). Statistics from the U.S. Public Health Service hospitals active in detoxifying and treating addicts showed a recidivism rate of 97 percent, and some observers thought it was even higher. Once the extent of the use of heroin in Vietnam became apparent, the great fear of Army and Government officials was that the maxim "Once an addict, always an addict" would operate, and most of the experts agreed that this fear was entirely justified. Treatment and rehabilitation centers were set up in Vietnam, and the Army's slogan that heroin addiction stopped "at the shore of the South China Sea" was heard everywhere. As virtually all observers agree, however, those programs were total failures. Often people in the rehabilitation programs used more heroin than when they were on active duty (Zinberg 1972).

Nevertheless, as the study by Robins et al. (1977) has shown, most addiction did indeed stop at the South China Sea. For addicts who left Vietnam, recidivism was approximately 10 percent after they got back home to the United States--virtually the reverse of the previous U.S. Public Health Service figures. Apparently it was the abhorrent social setting of Vietnam that led men who ordinarily would not have considered using heroin to use it and often to become addicted to it. But evidently they associated its use with Vietnam, much as hospital patients who are receiving large amounts of opiates for painful medical conditions associate the drug with the condition. The returnees were like those patients (mentioned earlier) who, having taken opiates to relieve a physiological disturbance, usually do not crave the drug after the condition has been alleviated and they have left the hospital.

Returning to the first example--psychedelic drug use in the 1960s--it is my contention that control over use of these drugs was established by the development in the counterculture of social sanctions and rituals very like those surrounding alcohol use in the culture at large. "Only use the first time with a guru" was a sanction or rule that told neophytes to use the drug the first time with an experienced user who could reduce their secondary anxiety about what was happening by interpreting it as a drug effect. "Only use at a good time, in a good place, with good people" was a sanction that gave sound advice to those taking a drug that would sensitize them so intensely to their inner and outer surroundings. In addition, it conveyed the message that the drug experience could be simply a pleasant consciousness change, a good experience. The specific rituals that developed to express these sanctions--just when it was best to take the drug, how, with whom, what was the best way to come down, and so on--varied from group to group, though some spread from one group to another.

It is harder to document the development of social sanctions and rituals in Vietnam. Most of the early evidence indicated that the drug was used heavily in order to obscure the actualities of the war, with little thought of control. Yet later studies showed that many enlisted men used heroin in Vietnam without becoming addicted (Robins and Helzer 1975). More important, although 95 percent of heroin-addicted Vietnam returnees did not become readdicted in the United States, 88 percent did use heroin occasionally, indicating that they had developed some capacity to take the drug in a controlled way (Robins et al. 1977). Some rudimentary rituals, however, do seem to have been followed by the men who used heroin in Vietnam. The act of gently rolling the tobacco out of an ordinary cigarette, tamping the fine white powder into the opening, and then replacing a little tobacco to hold the powder in before lighting up the opium joint seemed to be followed all over the country, even though the units in the north or in the highlands had no direct contact with those in the Delta (Zinberg 1971). To what extent this ritual aided control is, of course, impossible to determine. Having observed it many times, however, I can say that it was almost always done in a group and thus formed part of the social experience of heroin use. While one person was performing the ritual, the others sat quietly and watched in anticipation. It would be my guess that the degree of socialization achieved through this ritual could have had important implications for control.

Still, the development of social sanctions and rituals probably occurs more slowly in the secretive world of illicit drug use than with the use of a licit drug like alcohol, and it is hard to imagine that any coherent social development occurred in the incredible pressure cooker of Vietnam. Now the whole experience has receded so far into history that it is impossible to nail down what specific social learning might have taken place to be passed on. But certainly Vietnam illustrates the power of the social setting to influence large numbers of apparently ordinary people to engage in drug activity that was viewed as extremely deviant and to limit that activity to that setting. Vietnam also showed that heroin, too, despite its tremendous pharmaceutically addictive potential, is not universally or inevitably addictive.

Further study of various patterns of heroin use, including controlled use, in the United States confirms the lessons taught by the history of alcohol use in America, the use of psychedelics in the 1960s, and the use of heroin during the Vietnam War. The social setting, with its formal and informal controls, its capacity to develop new informal social sanctions and rituals, and its transmission of information in numerous informal ways, is a crucial factor in the controlled use of any intoxicant. This does not mean, however, that the pharmaceutical properties of the drug or the attitudes and personality of the user count for little or nothing. As I stated at the beginning of this essay, all three variables--drug, set, and setting--must be included in any valid theory of drug use. In every case of use it is necessary to understand how the specific characteristics of the drug and the personality of the user interact and are modified by the social setting and its controls.

THEORIES ON

One's Relationship to Nature

Addiction to Pleasure

A Biological and Social-Psychological Theory of Addiction

Nils Bejerot, M.D.

INTRODUCTION

In my experience, the debate on the nature of addiction has been too narrowly limited to lead to a general theory that can explain the varied and complicated phenomena which these conditions present.

The earliest explanations were that the soul of the individual was possessed by the devil or by satanic forces. In medical circles in the first half of the nineteenth century it was believed that dependence was associated with the digestive system (opium eaters and their severe opium hunger). From the viewpoint of cultural history, we can trace the development of this alimentary theory in the psychoanalytical concept of oral fixation.

When the subcutaneous injection needle was introduced in 1856, physicians thought that the addiction problem could be eliminated as a medical complication. During the American Civil War, however, it was found that subcutaneous injections led to dependence more rapidly than oral administration, and thousands of wounded soldiers were afflicted by an addiction which remained even after the physical injury and pain had completely disappeared. Because of this, morphinism was for a time called the "soldiers' disease" or the "army disease" in the United States (O'Donnell and Ball 1966).

During the twentieth century, the development of tolerance and physical dependence has played an important part and has obscured the mechanism of addiction (Fishman 1978). Before describing these interpretations and theories, I will give a simple example of what I mean by the development of a dependence.

NICOTINISM AS A MODEL DEPENDENCE

The malignant addictions are so emotionally charged and subject to so many contradictory explanatory models that it is difficult to discuss them without a continual risk of misunderstanding. We need to examine an addiction which is not emotionally enflamed, is not surrounded by social sanctions, which is well known and of common occurrence in different societies and groups, and, in addition, presents all the relevant phenomena of dependence. I consider that nicotinism is a simple and good example of the development of dependence.

The dotted line A-B in figure 1 shows a young person who has not yet come in contact with tobacco. In time, tobacco makes its entry (B).

We can immediately state that the young debutant has neither an innate need for nicotine nor a nicotine craving. No psychological or sociological analyses are required to show that the totally decisive reason why a child smokes a cigarette for the first time is purely and simply curiosity.

Nicotine is a fairly strong stimulant. An ordinary cigarette contains only about 1.5 mg nicotine, but this is a large dose for someone who is not used to smoking or snuffing tobacco and who has perhaps half the weight of an adult.

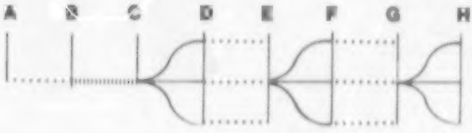
The debutant in our example feels giddy, suffers from nausea and headache, and may even vomit. In spite of the discomfort, the common pattern is that the beginner obstinately coughs through one pack of cigarettes after the other (B-C). This may in itself seem strange, since the beginner at this stage has still not developed a craving for nicotine or a dependence upon it. The reason for continuation of the initial smoking is usually that the individual wishes to imitate older friends and adults, and in this way to appear more grown up and self-confident than he or she really is.

VOLUNTARY PHASE

Our young smoker still has complete voluntary control over nicotine consumption. It is no problem at all to refrain from smoking a cigarette when this fits his or her (usually unconscious) goal. At this stage, the smoker has aims other than to satisfy a craving for nicotine, as this has not yet been established. Some smokers remain their whole lives in this stage, which may suitably be described as the voluntary phase (B-C in figure 1). These persons may sometimes take a cigarette instead of a biscuit with coffee, since this reduces their intake of calories. Or they may smoke a cigarette in order to have something to do with their hands in company where they do not really feel at home, or perhaps just to make an impression and appear to be sunk in thought when they really want to hide their shyness, etc. Typical of the voluntary phase is that there is some motive for smoking other than to satisfy a still nonexistent craving for nicotine.

Voluntary smokers are not to be regarded as nicotinists in this definitional system. I would describe them as incidental smokers. The characteristic factor in the voluntary phase is that the will and commonsense are in control of the drug effects and emotions. It is the individual's "independent will" which steers behavior.

FIGURE 1.—*Diagrammatic presentation of the development of nicotinism*



A-B	The period before the tobacco debut
B-C	Controlled smoking or voluntary phase
C-D	Compulsive smoking or phase of active dependence
D-E	Phase of achieved or accidental abstinence or latent dependence
E-F	Relapse of active dependence
F-G	Renewed abstinence period
G-H	Relapse and chronic nicotinism

THE DEPENDENCE PHASE

If one is unwise enough to continue for a time to inspire nicotine, certain elements in the nervous system are stimulated, and the individual begins to learn how to appreciate the pleasant stimulant effect of nicotine. Through learning, a direct conditioning, the individual glides imperceptibly into a nicotine dependence. A craving for nicotine--or rather for the effects of nicotine--begins to develop.

As far as I know, there are no investigations into whether it requires 10, 50, or 100 packs of cigarettes before an individual glides into a manifest nicotine dependence. The phenomenon appears to be an ordinary pharmacological dose-response relation, with variables such as the size of the dose (the nicotine content of the cigarettes), the intensity of the dose (how often one smokes), the duration of smoking, and the individual variations which always occur in a biological material.

It is characteristic for the phase of dependence that the craving for nicotine resembles the character and force of a natural drive. Another way of expressing this is that the acquired craving for satisfaction which has developed from the effects of nicotine is in control of the "will," which adjusts to the craving in a similar way as to innate biological drives. In psychoanalytic terminology one would say that the forces in the "id" have taken control over the forces of the "ego" and "superego."

If smoking is forbidden during lectures and meetings, the nicotinist, without great distress, can delay smoking until there is a pause, in the same way as he or she can delay the satisfaction of sexual needs. The nicotinist would also, with a certain amount of effort, be able to manage a full-time job at a petrol station where smoking would be impossible during the working day. The impossibility of satisfying the nicotine craving in such a situation will reduce the abstinence and make it more endurable, in rather the same way as a seaman can more easily repress his sexual craving amid the storms at sea than amid the brothels in port.

When nicotinists are in a situation where the satisfaction of the nicotine craving does not give rise to any inconvenience, they consume the required dose. If confirmed nicotinists are unable to administer a couple of milligrams of nicotine every 20th to 30th minute during their waking hours, they feel that something essential is missing. In my opinion, the process described here represents the general dynamics of how a drug dependence arises.

If for any reason the nicotinist in this situation wants to stop smoking, it is, as we know, always an uncertain venture; and this is the case even if the individual is aware of the serious consequences of smoking on health.

THE IMPORTANCE OF THE BASIC PERSONALITY

The basic personality is not without significance for the development of nicotinism or for whether the individual will eventually overcome the dependence. It is not, however, of any decisive importance in what sort of brain nicotinism lies. Let us take as a hypothetical experiment that nicotinism afflicts an individual without any physical, mental, erotic, social, economic, or other problem. If the individual's sole problem is nicotinism, this will not make it essentially easier for him or her to stop smoking than it would for anyone else.

When the nicotinists, both those who are free from problems and those overwhelmed by them, discontinue their administration of nicotine, they enter into the same kind of abstinence state, characterized by strong and frequent waves of intense nicotine hunger. We know from experience that most of them quickly relapse into their smoking habit. One year after an ambitious treatment program for smokers, about 75 percent of them have relapsed, even in the case of well-motivated groups.

If we have a singularly determined and strong-willed person, who, in addition, has definitely determined to stop smoking, we know that the waves of strong nicotine hunger will in time decline in strength and frequency. After a few months, they will have almost disappeared, but even years later--when the ocean, so to speak, is as smooth as a mirror--there may still arise isolated, strong swells of nicotine suction, particularly in situations where previously the individual always began smoking, for instance, while playing bridge or after a good meal. It shows that smoking is often supported by several reinforcing conditioning factors. Even these late swells fade away in time, but I have heard of several ex-smokers who have experienced them several years after a free interval, and after more than ten years of total abstinence.

DEPENDENCE MECHANISM AND THE LENGTH OF THE ABSTINENCE PERIOD

If a previously heavy smoker undergoes such a prolonged period of abstinence that even the late abstinence effects have ceased many years previously, the individual has still not recovered, but is only an abstinent nicotinist with a latent nicotinism for the rest of his or her life. If the abstinent nicotinist, after 10, 15, or 20 years, smokes a few cigarettes through a desire "to see how it feels now," this will almost without exception lead to continued smoking--after a certain threshold consumption is exceeded. After a short period, the individual usually reverts to the same advanced pattern of consumption, and the length of the intermediary abstinence period seems to be of secondary importance (E-F, figure 1).

In reality, nicotinism seems to be an "incurable" condition in the sense that a very long period of total abstinence does not cure nicotine dependence. There can be no return to the youthful, innocent relation to tobacco or to the previous learning period, the voluntary phase, when experimentation with tobacco and sporadic or regular smoking was under full voluntary control.

DEPENDENCE: A CONDITION IN ITSELF

There is nothing remarkable about the mechanisms surrounding nicotinism; they follow the well-known laws of learning theories. In my opinion, this shows very clearly that nicotinism represents a drug dependence and also that dependence is not a symptom, but a condition of its own.

Smoking the first cigarette is a result (symptom) of youthful curiosity. A couple of decades later, smoking perhaps a pack of cigarettes a day is not a late symptom or expression of the curiosity of those early years or a need to imitate older friends; it is a condition of its own--a nicotine dependence. A dialectical change has taken place, a change in quality from the voluntary phase to the phase of dependence.

CHEMICALLY INDUCED ADDICTIONS

As we know, a large number of chemical substances may give rise to drug dependence of varying strength. Common to them all is the fact that they give pleasant effects in one way or another. Often it may be the subtle and, for the experimenter, perhaps completely unconscious effects which are decisive for the development of dependence. Drugs that give more unpleasant than pleasant sensations are obviously unsuitable as intoxicants or as a source of enjoyment. Even though certain drugs, specifically alcohol, tobacco, and cannabis, may on first contact seem repellent or uninteresting, the individual may nonetheless persist because of cultural pressure and learn to appreciate the euphoric qualities which were not initially discernible. Other drugs seem to give pleasant effects from the first dose (if the dose is of adequate size). These are caffeine, amphetamine, cocaine, and morphine.

From the aspects of biology and learning theory, it seems that there is no difference, in principle, between caffeinism, nicotinism, alcoholism, and what is usually called drug addiction. On the other hand, drugs vary greatly in the intensity of the euphoria they provide, the toxic effects, and the subsequent ability of the user to function socially. Some may be enjoyed daily throughout life without noticeable injurious effects (caffeine), others give rise to marked complications only after prolonged consumption, while a third group may result in rapid dependence and entail severe complications (heroin and cocaine).

The social acceptance of different types of drug use varies greatly in different cultures and circles within cultures. Risk groups and initiation mechanisms vary greatly also for different drugs and different conditions. We will return to this later.

PHYSICAL DEPENDENCE: ONLY A COMPLICATION

Until the 1970s, pharmacologists had stubbornly held that it is the direct pharmacological effects of certain drugs upon the nervous system, and the vegetative reactions when these drugs are withdrawn (abstinence syndrome) which constitute addiction. "Physical dependence" was conceived as an essential component in the concept of addiction. During recent years, however, even pharmacologists and neurophysiologists are inclined to agree that addiction has a more general import than pharmacological effects and vegetative reactions to them (Olds and Milner 1954). The development of tolerance and the irrelevance of vegetative phenomena for dependence may be illustrated by a couple of examples.

The newborn infant of an opiate-dependent mother may be on the verge of death from the severe vegetative abstinence reactions (vomiting, diarrhea, etc.), but such a child is not, and has never been, an addict, since it has not learned to appreciate the euphoric effects of opiates, but has only been exposed to the development of tolerance.

If, in an intramural milieu, we were to give a group of people methadone (a morphine substitute with prolonged effects) mixed in their food, they would, after a month, be completely saturated with (tolerant of) opiates, and this without their becoming aware of it themselves. They would, of course, notice the constipation and the lack of sexual appetite, but would not suspect the secret administration of drugs. An intravenous injection of heroin in this situation would be without effect, either in regard to euphoria or pharmacologic toxicity (overdose). If in this situation the methadone administration were suddenly stopped, the individuals would soon become very ill and might think that they had food poisoning. If, instead, the doses were reduced gradually, they could recover from tolerance in a month without knowing that they had had maximal doses of opiates in their bodies and a fully developed tolerance. (The methadone blockade treatment of heroinists is based on these principles.)

In the same way, the risk for the development of dependence is small when patients suffering from pain are given morphine in adequate doses. The euphoric effects are "neutralized" by the pain and anxiety, and the patient is relieved of a great deal of suffering. If morphine is given in an inadequate way, the patient may experience a pleasurable morphine reaction. If, in addition, he or she is then told what had produced the pleasant effects, the basis would be laid for dependence as a complication of the medical treatment.

PLEASURE AS A BIOLOGICAL PREFERENCE SYSTEM

It is well known that animal behavior is steered by a number of internal and external factors--genetic and acquired, persistent and incidental. Hunger, thirst, sexual craving, aggression, fear, self-preservation, and the ability of the individual and the race to adjust and survive are well-known steering factors.

Unconsciously it seems that all observable internal and external conditions and previous memories and acquired knowledge are weighed, together with constitutional resources and current physiological conditions, in deciding behavior at each moment. Thus a thirsty animal seeks a source of water, but if it suspects danger, the animal will endure its thirst or find a safer place in which to satisfy it.

All stimuli, schematically speaking, must be experienced either as pleasant, unpleasant, or indifferent. In this way, everything can be reduced to pleasure or pain, and the balance between these experiences seems to steer behavior.

Neurophysiologists have analyzed the mechanisms of pleasure in the mid-brain and limbic system. Olds and Milner (1954) applied electric stimulation to the pleasure center of the hypothalamus of rats which were able to tramp on a pedal and receive an electric current. This was obviously quite pleasurable and resulted in strong repetitive behavior. The males stimulated themselves up to 5,000 times a day until they fell down, unconscious, from exhaustion. They did not even give themselves time to drink, eat, or take an interest in females in heat. This phenomenon may be seen as the biological archetype for addiction. Not only the social and pharmacological factors, but the psychological factors had been eliminated here, and addiction appears as a fixation in a monotonous stimulation of the pleasure centers with a repetitive behavior of enormous persistence as a result. The behavior experienced is so pleasurable that, if interrupted, it is desired again with the force and character of a natural drive. This direct stimulation of the pleasure mechanisms and fixation to a repetitive behavior may be seen as the simplest model for addiction.

ADDICTION WITHOUT DRUGS

Freud, on one occasion, described masturbation as "the primary addiction" and compared it with drug dependence. This seems to be very sharp sighted and relevant. Sexuality may be seen as a biological, endogenic, and very potent pleasure system which normally dominates the efforts and pleasure seeking of animals and humans during long periods of their lives.

Numerous exogenic stimuli may, in various ways, lead to strong feelings of pleasure and through learning give rise to a conditioning which directs the future pleasure-seeking behavior of the individual in a way similar to natural drives, and is strongly reminiscent of sexuality. When this is brought about by means of drugs we call it drug addiction, but the phenomenon may also be initiated in many other ways. As an example of an addiction without drugs we may take gambling, which is characterized by all the elements that occur in a drug addiction except that the stimulation is derived from a game. Other conditions that seem to have a similar basic mechanism are pyromania, kleptomania, anorexia nervosa, and overeating. In a more general model it seems that even nail biting, neurodermatitis, phobia, compulsive neuroses, perhaps paranoia querulans, and many other disturbances fit into this pattern. They have in common that a great discomfort is reduced or eliminated for a time through certain thought patterns or behavior, and in this way they provide a pleasurable gain. Thoughts may in such conditions fill the same function as action.

DRUG ADDICTION: A CHEMICAL LOVE

The pleasure mechanism may be stimulated in a number of ways and give rise to a strong fixation on repetitive behavior. Stimulation with drugs is only one of many ways, but one of the simplest, strongest, and often also the most destructive.

When strongly euphoric drugs are given to experimental animals, it seems that all of them continue to seek the drugs, providing that they have learned to appreciate them and that they are not in a state of exhaustion caused by the drug (as, for instance, on prolonged overstimulation with central nervous system stimulants and associated dehydration, etc.). From the biological viewpoint, it therefore seems to be normal to continue with chemical pleasure stimulation once it has commenced and the behavior has been learned. In humans, on the other hand, it is regarded as abnormal, "deviant," or morbid to continue with intoxicating behavior, while the biologically atypical behavior--to refrain from pleasure or to use the drug "with restraint"--is socially recommended, accepted, or tolerated.

If the pleasure stimulation becomes so strong that it captivates an individual with the compulsion and force characteristic of natural drives, then there exists what I would describe as an addiction. This addiction usually--but not inevitably--is expressed in addictive behavior, that is, a specific, repetitive pleasure stimulation with lack of motivation to change this behavior, even if the individual realizes that it is extremely injurious. Addiction may easily become even stronger than the instinct for self-preservation.

A pseudomotivation for treatment is a very common phenomenon in addiction. The individual seeks help and treatment of troublesome somatic, psychic, social, and many other kinds of complications to addiction without really being prepared to give up the special source of pleasure that causes the addiction. In the more advanced and socially unaccepted addictions (alcoholism, heroinism, anorexia nervosa, etc.), addicts usually act as full-time defense lawyers for their addiction, and usually succeed in hiding their deepest aims from relatives, physicians, psychologists, social workers, attorneys, and judges, in a cunning defensive game around the protection of their addiction.

The simplest way of regarding a drug addiction is to see it as falling in love with specific, pleasurable sensations (or the means to prevent pain). The lack of "treatment motivation" and honesty in regard to dependence is often interpreted as a sign of a primary character disturbance. I do not consider this to be peculiar, however, as commonsense is usually put aside by the strong pleasure fixation in love and in addiction.

DEPENDENCY: IN THE MEMORY

Falling in love is a learned phenomenon and is located in the memory and not in gross physiological and vegetative reactions (although the memory functions do have their special physiological base). This is also the case with drug dependence. I will illustrate these memory mechanisms with a couple of banal examples.

Suppose that a motorcyclist is out with his fiancee, has an accident, strikes his head on the road, and loses his memory for a while. He would be completely at a loss if his fiancee entered the hospital ward with a bunch of flowers. Since he could not remember that he had seen her before, he could not, of course, be in love with her.

I have myself seen an elderly nicotinist who suffered from senile dementia after more than 60 years of intensive smoking. One day when the patient received his daily two packs of cigarettes from his relatives, he refused them indignantly, with the explanation that he had never been a smoker. When the relatives protested he said, "You must have mixed me up with someone else." He never asked for cigarettes again. When the memory is extinguished, the dependence disappears.

A DEFINITION

If, after this discussion, we were to try to formulate a definition of the concept of addiction, it should cover active and passive, direct and indirect, constructive and destructive addictions. It could be given the following general form: An emotional fixation (sentiment) acquired through learning, which intermittently or continually expresses itself in purposeful, stereotyped behavior with the character and force of a natural drive, aiming at a specific pleasure or the avoidance of a specific discomfort.

Addiction may take many forms and may occur in different phases.

(a) The currency of addiction: In manifest addictive behavior, addiction is suitably described as active. If the individual through counterforces (treatment, social control, fear of complications, sanctions, etc.) sacrifices the specific stimulation and remains abstinent, the addiction is, for the time, passive. If the sentiment disappears completely through deconditioning (reduction or absence of stimulation in response to the behavior), reconditioning, loss of memory, or cerebral damage, the addiction is extinguished.

(b) The stimuli of addiction: If the stimulation occurs with the help of drugs, a drug addiction is present. If it occurs through other pleasurable exogenic stimuli, behavior such as gambling, arson, kleptomania, and overeating may arise. The addictions which have arisen from pleasure stimulation may be called direct and will differ from those that arise from very unpleasant experiences--as phobias, compulsive neuroses, paranoid reactions, nail biting, and anorexia nervosa. Since the stereotyped behavior in these cases serves to eliminate discomfort, they may be called indirect addictions.

(c) The relevance of addiction: If addiction causes a deterioration in the health of the individual and/or the ability to function socially, it may be described as destructive; if it increases these qualities, it is constructive. Among constructive addictions we can include the creative obsession of scientists, authors, artists, and politicians, also the extreme attainment fixation of successful athletes and businesspersons.

According to these definitions, everyone has a number of addictive behaviors. Many sacrifice their lives for their destructive addictions; others receive the Nobel Prize for their constructive ones.

SPECIAL POPULATIONS

Addiction of the therapeutic type is the only one of the malignant forms of addiction in which women are as numerous as men and may even be somewhat overrepresented. Anxious, asthenic, neurotic, and easily stressed personalities run a greater risk.

Addiction of the professional type usually afflicts physicians who were originally very ambitious and had unrealistically high expectations about their careers. They became disappointed when they realized that they would never reach the goal they had aimed at (Pescor 1942) and fell into drug abuse through self-treatment of somatic problems.

Addiction of the epidemic type is always a breach of norms and is therefore strongly associated with groups at risk for norm breaking, such as active criminals, bohemians, young people, etc. The more the abuse spreads, the less of a breach of norms it becomes, and the greater will be the proportion of ordinary youths who enter the risk zone and are finally drawn into addictive behavior. Finally, an epidemic may in this way change into an endemic, as marijuana smoking has now done in a large part of the United States (Johnson 1973).

Addiction of the cultural type threatens, in principle, the whole population. In most cultures, women are protected by the norms in regard to intoxicated behavior. Among men, the group with the greatest risk consists of those who have plenty of time, money, access to alcohol, and so on. The high-risk groups for alcoholism are authors, artists, musicians, entertainers, diplomats, commercial travelers, seamen, and people working in restaurants.

The various addictive behaviors still cannot be explained by a single model, but they can be explained by a combination of general biological and social psychological models.

Methadone Maintenance
A Theoretical Perspective

Vincent P. Dole, M.D.
Marie E. Nyswander, M.D.

The Methadone Maintenance Research Program (Dole and Nyswander 1965, 1966; Dole et al. 1966) began in 1963 with pharmacological studies conducted on the metabolic ward of the Rockefeller University Hospital. Only six addict patients were treated during the first year, but the results of this work were sufficiently impressive to justify a trial of maintenance treatment of heroin addicts admitted to open medical wards of general hospitals in the city.

The dramatic improvements in social status of patients on this program exceeded expectations. The study started with the hope that heroin-seeking behavior would be stopped by a narcotic blockade but it certainly was not expected that we would be able to retain more than 90 percent of the patients and that almost three-fourths would be socially productive and living as normal citizens in the community after only six months of treatment. Prior to admission, almost all of the patients had supported their heroin habits by theft or other antisocial activities. Further handicapped by the ostracism of the community, slum backgrounds, minority group status, school dropout status, prison records, and antisocial companions, they had seemed poor prospects for social rehabilitation.

The unexpected response of these patients to a simple medical program forced us to reexamine some of the assumptions that we brought to the study. Either the patients that we admitted to treatment were quite exceptional, or we had been misled by the traditional theories of

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This paper, prepared by Jack E. Nelson and reviewed by Marie Nyswander, is based largely on an article written by Dr. Nyswander and Dr. Vincent P. Dole, "Methadone Maintenance and Its Implication for Theories of Narcotic Addiction," Research Publications of the Association for Research in Nervous and Mental Disease, 49-359-66, 1968. Material from this article is reprinted with the permission of the Association for Research in Nervous and Mental Disease.

addiction (Terry and Pellens 1928). If, as is generally assumed, our patients' long-standing addiction to heroin had been based on weaknesses of character--either a self-indulgent quest for euphoria or a need to escape reality--it was difficult to understand why they so consistently accepted a program that blocked the euphoric action of heroin and other narcotic drugs, or how they could overcome the frustrations and anxieties of competitive society to hold responsible jobs.

Implicit in the maintenance programs is an assumption that heroin addiction is a metabolic disease, rather than a psychological problem. Although the reasons for taking the initial doses of heroin may be considered psychological--adolescent curiosity or neurotic anxiety--the drug, for whatever reason it is first taken, leaves its imprint on the nervous system. This phenomenon is clearly seen in animal studies: A rat, if addicted to morphine by repeated injections at one to two months of age and then detoxified, will show a residual tolerance and abnormalities in brain waves in response to challenge doses of morphine for months, perhaps for the rest of its life. Simply stopping the drug does not restore the nervous system of this animal to its normal, preaddiction condition. Since all studies to date have shown a close association between tolerance and physical dependence, and since the discomfort of physical dependence leads to drug-seeking activity, a persistence of physical dependence would explain why both animals and humans tend to relapse to use of narcotics after detoxification. This metabolic theory of relapse obviously has different implications for treatment than the traditional theory that relapse is due to moral weakness.

Whatever the theory, all treatment should be measured by results. The main issue, in our opinion, is whether the treatment can enable addicts to become normal, responsible members of society, and if a medication contributes to this result it should be regarded as useful chemotherapy. Methadone, like sulfanilamide of the early antibiotic days, undoubtedly will be supplanted by better medications, but the success of methadone maintenance programs has at least established the principle of treating addicts medically.

The efficacy of methadone as a medication must be judged by its ability or failure to achieve the pharmacological effect that is intended--namely, elimination of heroin hunger and heroin-seeking behavior, and blockade against the euphoriant actions of heroin. The goal of social rehabilitation of criminal addicts by a treatment program is a much broader objective; it includes the stopping of heroin abuse, but is not limited to this pharmacological effect. Failures in rehabilitation programs therefore must be analyzed to determine whether they are due to failures of the medicine, or to inability of the therapists to rehabilitate patients who have stopped heroin use. Individuals who have stopped heroin use with methadone treatment but who continue to steal, drink excessively, or abuse nonnarcotic drugs, or are otherwise antisocial, are failures of the rehabilitation program but not of the medication.

When the Food and Drug Administration asks for proof of efficacy of a new drug it is the pharmacological efficacy that is in question. For example, diphenylhydantoin is accepted as an efficacious drug for prevention of epileptic seizures. Whether or not the treated epileptics obtain employment or otherwise lead socially useful lives is not relevant to the evaluation of this drug as an efficacious drug for prevention of epileptic seizures or as an anticonvulsant. Similarly with methadone.

With thousands of patients now living socially acceptable lives with methadone blockade and with many more street addicts waiting for admission, the question as to whether these patients are exceptional is no longer a practical issue. The theoretical question, however, remains: Is addiction caused by an antecedent character defect, and does the maintenance treatment merely mask the symptoms of an addictive personality? The psychogenic theory of addiction would say so. This theory has a long history--at least 100 years (Terry and Pellens 1928)--and is accepted as axiomatic by many people. What, then, is the evidence for it?

Review of the literature discloses two arguments to support the psychogenic, or character defect, theory: the sociopathic behavior and attitude of addicts and the inability of addicts to control their drug-using impulse. Of these arguments, the first is the most telling. Even a sympathetic observer must concede that addicts are self-centered and indifferent to the needs of others. To the family and the community the addict is irresponsible, a thief, and a liar. These traits, which are quite consistently associated with addiction, have been interpreted as showing a specific psychopathology. What is lacking in this argument is proof that the sociopathic traits preceded addiction.

It is important to distinguish the causes from the consequences of addiction. The decisive proof of a psychogenic theory would be a demonstration that potential addicts could be identified by psychiatric examination before drug usage had distorted behavior and metabolic functions. However, a careful search of the literature has failed to disclose any study in which a characteristic psychopathology or "addictive personality" has been recognized in a number of individuals prior to addiction. Retrospective studies, in which a record of delinquency before addiction is taken as evidence of sociopathic tendencies, fail to provide the comparative data needed for diagnosis of deviant personality. Most of the street addicts in large cities come from the slums where family structure is broken and drugs are available. Both juvenile delinquency and drug use are common. Some delinquents become addicted to narcotic drugs under these conditions, whereas others do not. There is no known way to identify the future addicts among the delinquents. No study has shown a consistent difference in behavior or pattern of delinquency of adolescents who later become addicts and those who do not.

Theft is the means by which most street addicts obtain money to buy heroin and, therefore, is nearly an inevitable consequence of addiction. For the majority this is the only way that they can support an expensive heroin habit. The crime statistics show both the force of drug hunger and its specificity; almost all of the crimes committed by addicts relate to the procurement of drugs. The rapid disappearance of theft and antisocial behavior in patients on the methadone maintenance program strongly supports the hypothesis that the crimes that they had previously committed as addicts were a consequence of drug hunger, not the expression of some more basic psychopathology. The so-called sociopathic personality was no longer evident in our patients.

The second argument, that of deficient self-control, is more complicated because it involves the personal experience of the critic as well as that of the patient. Moralists generally assume that opiates are dangerously pleasant drugs that can be resisted only by strength of character. The pharmacology is somewhat more complicated than this. For most normal persons morphine and heroin are not enjoyable drugs--at least not in the initial exposures. Given to a postoperative patient these analgesics provide a welcome relief of pain, but addiction from such medical use is uncommon. When given to an average pain-free subject, morphine produces nausea and sedation, but rarely euphoria. What, then, is the temptation to become an addict? So far as can be judged from the histories of addicts, many of them found the first trials of a narcotic in some sense pleasurable or tranquilizing, even though the drug also caused nausea and vomiting. Perhaps their reaction to the drug was abnormal, even on the first exposure. However this may be, with repeated use and development of tolerance to side effects, the euphoric action evolved and the subjects became established addicts.

Drug-seeking behavior, like theft, is observed after addiction is established and the narcotic drug has become euphorigenic. The question as to whether this abnormality in reaction stems from a basic weakness of character or is a consequence of drug usage is best studied when drug hunger is relieved. Patients on the methadone maintenance program, blockaded against the euphorigenic action of heroin, turn their energies to schoolwork and jobs. It would be easy for them to become passive, to live indefinitely on public support and claim that they had done enough in winning the fight against heroin. Why they do not yield to this temptation is unclear, but in general they do not. Their struggles to become self-supporting members of the community should impress the critics who had considered them self-indulgent when drug-hungry addicts. When drug hunger is blocked without production of narcotic effects, the drug-seeking behavior ends.

So far as can be judged from retrospective data, narcotic drugs have been quite freely available in some areas of New York City, and experimentation by adolescents is common. The psychological and metabolic theories diverge somewhat in interpreting this fact; the first postulates preexisting emotional problems and a need to seek drugs for escape from reality, whereas the alternative is that trial of drugs, like smoking the first cigarette, may be a result of a normal adolescent curiosity and not of psychopathology (Wikler and Rasor 1953). As to the most important point--the reasons for continuation of drug use in some cases and not in others--there is no definitive information, either psychological or metabolic. This is obviously a crucial gap in knowledge. Systematic study of young adolescents in areas with high addiction rates is needed to define the process of becoming addicted and to open the way for prevention.

The other extreme--the cured addict--involves a controversy as to the goal of therapy. Those of us who are primarily concerned with the social productivity of our patients define success in terms of behavior--the ability of the patients to live as normal citizens in the community--whereas other groups seek total abstinence, even if it means confinement of the subjects to an institution. This confusion of goals has barred effective comparison of treatment results.

Actually, the questions to be answered are straightforward and of great practical importance. Do the abstinent patients in the psychological programs have a residual metabolic defect that requires continued group pressure and institutionalization to enforce the abstinence? Conversely, do the patients who are blockaded with methadone exhibit any residual psychopathology? No evidence is available to answer the first question. As to the latter point, we can state that the evidence so far is negative. The attitudes, moods, and intellectual and social performance of patients are under continuous observation by a team of psychiatrists, internists, nurses, counselors, social workers, and psychologists. No consistent psychopathology has been noted by these observers or by the social agencies to which we have referred patients for vocational placement. The good records of employment and school work further document the patients' capacity to win acceptance as normal citizens in the community.

The real revolution of the methadone era was its emphasis on rehabilitation rather than on detoxification. This reversed the traditional approach to addiction, which had been based on the assumption that abstinence must come first. According to the old theory, rehabilitation is impossible while a person is taking drugs of any kind, including methadone. The success of methadone programs in rehabilitating addicts who had already failed in abstinence programs decisively refuted this old theory. Indeed, nowhere in the history of treatment has a program with the abstinence approach achieved even a fraction of the retention rate and social rehabilitation now seen in the average methadone clinic. This statement includes all of the abstinence-oriented programs of governmental institutions, therapeutic communities, and religious groups for which any data are available (Brecher 1972; Glasscote 1972).

We believe that it is a serious mistake for programs to put a higher value on abstinence than on the patient's ability to function as a normal member of society. After the patient has arrived at a stable way of life with a job, a home, a position of respect in his community, and a sense of worth, it may, or may not, be best to discontinue methadone, but at least he can consider this option without pressure. The pharmacologic symptoms of withdrawal will be the same whether or not the addict is socially rehabilitated, but with a job and family there is much more to lose if relapse occurs, and therefore the motivation to resist a return to heroin will be strong. The time spent in maintenance treatment does not make detoxification more difficult. It has proved very easy to withdraw methadone from patients who have been maintained for one to eight years when the reduction in dose has been gradual and the patient free from anxiety.

As with heroin, the real problems begin after withdrawal. The secondary abstinence syndrome, first described by Himmelsbach, Martin, Wikler, and colleagues at the United States Public Health Hospital, Lexington, Kentucky, in patients detoxified from morphine and heroin, reflects the persistence of metabolic and autonomic disturbances in the postnarcotic withdrawal period (Himmelsbach 1942; Martin et al. 1963; Martin and Jasinski 1969): These persistent abnormalities in metabolism are clearly pharmacologic since they occur also in experimental animals addicted to narcotics and then detoxified. Followup studies of abstinent ex-addicts have emphasized the frequency of alcoholism and functional deterioration (Brecher 1972).

An unfortunate consequence of the early enthusiasm for methadone treatment is today's general disenchantment with chemotherapy for addicts. What was not anticipated at the onset was the nearly universal reaction against the concept of substituting one drug for another, even when the second drug enabled the addict to function normally. Statistics showing improved health and social rehabilitation of the patients receiving methadone failed to meet this fundamental objection. The analogous long-term use of other medications such as insulin and digitalis in medical practice has not been considered relevant.

Perhaps the limitations of medical treatment for complex medical-social problems were not sufficiently stressed. No medicine can rehabilitate persons. Methadone maintenance makes possible a first step toward social rehabilitation by stabilizing the pharmacological condition of addicts who have been living as criminals on the fringe of society. But to succeed in bringing disadvantaged addicts to a productive way of life, a treatment program must enable its patients to feel pride and hope and to accept responsibility. This is often not achieved in present-day treatment programs. Without mutual respect, an adversary relationship develops between patients and staff, reinforced by arbitrary rules and the indifference of persons in authority. Patients held in contempt by the staff continue to act like addicts, and the overcrowded facility becomes a public nuisance. Understandably, methadone maintenance programs today have little appeal to the communities or to the majority of heroin addicts on the street.

Methadone maintenance, as part of a supportive program, facilitates social rehabilitation, but methadone treatment clearly does not prevent opiate abuse after it is discontinued, nor does social rehabilitation guarantee freedom from relapse.

For the previously intractable heroin addict with a pretreatment history of several years of addiction and social problems, the most conservative course, in our opinion, is to emphasize social rehabilitation and encourage continued maintenance. On the other hand, for patients with shorter histories of heroin use, especially the young ones, a trial of withdrawal with a systematic followup is indicated when physician and patient feel ready for the test, and when they understand the potential problems after detoxification. The first step of withdrawing methadone is relatively easy and can be achieved with a variety of schedules, none of which have been shown to have any specific effect on the long-range outcome. The real issue is how well the patient does in the years after termination of maintenance.

A Chronobiological Control Theory

Mark Hochhauser, Ph.D.

CHRONOBIOLOGICAL VARIABLES

The effects of a given drug are a function of a number of variables; some of these variables, such as dosage level, have been considered as representing a specific chemical effect, unique to the amount of the drug ingested by the individual. Other variables, such as psychological set, are considered to be nonspecific, and may be viewed as an individualized behavioral process, insofar as each drug user will have his or her own idiosyncratic psychological response to a given drug.

Chronobiology (Halberg et al. 1977) offers a possible synthesis of these chemical and behavioral variables. Briefly stated, chronobiology (or biological rhythms) concerns the temporal aspects of biology; numerous experiments have shown that both animal and human behavior vary as a function of such rhythms (Luce 1971; von Mayersbach 1967) and that drug effects may be particularly sensitive to changes in such chronobiological rhythms.

A number of chronobiological rhythms have been identified: circadian (about 24 hours), diurnal/nocturnal (variations in light and dark periods), ultradian (less than 24 hours), monthly, or even yearly. Unfortunately, the role of such rhythms in human behavior has often been grossly misrepresented (e.g., McConnell 1978).

An understanding of chronobiological rhythms and how they affect (and are affected by) behavior is essential to a more complete understanding of subject-drug interactions. Unfortunately, very little is known about the field of developmental chronobiology (Petren and Sollberger 1967), although it has been documented that drugs will exert differential effects, depending upon the level of physiological and psychological maturity achieved by the subject (Young 1967; Vessel 1968; Vernadakis and Weiner 1974; Conroy and Mills 1970; Yaffee et al. 1968).

CHRONOBIOLOGY AND DRUGS

There has been some empirical and theoretical work done on the relationship between chronobiology and drug effects (Nair 1974; Reinberg 1973; Reinberg and Halberg 1971); however, such findings have not been extrapolated to problems of drug addiction. The following is a brief summary of the relationship between drugs and chronobiological variables.

AMPHETAMINES

Rats have demonstrated circadian variation in their susceptibility to d-amphetamine sulfate (Scheving 1969); furthermore, diurnal variations (i.e., differences in responsivity between periods of light and dark) have also been found for methamphetamine and p-chloromethamphetamine (Evans et al. 1973).

BARBITURATES

Rats have also demonstrated long-term variation (i.e., seasonal effects) in their responsivity to barbiturates (Beuthin and Bosquet 1970), as well as daily variations (Davis 1962). Such temporal effects have been attributed to changes in the rate of barbiturate metabolism by enzymes in the liver (Radzialowski and Bosquet 1968). Further, daily variations have been observed with phenobarbital (Pauly and Scheving 1964), and different doses of pentobarbital have had different effects as a function of circadian rhythms (Nelson and Halberg 1973). Moreover, there are apparent chronobiological differences even within the barbiturate category, as some barbiturates (e.g., phenobarbital) are long lasting, while others (e.g., hexobarbital) act for a shorter period of time (Muller 1974). Finally, it has been noted that the duration of barbiturate-induced sleep in rats was a function of the circadian phase of administration; the same barbiturate, administered in the same dose but at different times, produced variable levels of sleep. These findings suggested that the neurotransmitters that control sleep may display rhythmic levels of activity (Friedman 1974).

ALCOHOL

Alcohol studies on humans have found that ethanol is metabolized faster in the evening than in the afternoon, at least among some alcoholics (Jones and Paredes 1974). However, on cognitive tasks, Jones (1974) has found that alcohol impaired cognitive performance more in the afternoon than in the evening, suggesting a faster metabolic rate for alcohol in the afternoon. Studies with mice have also demonstrated dramatic variations in alcohol susceptibility over a 24-hour period; depending upon the time of administration, the mortality rate could be increased fivefold (Haus and Halberg 1959). More recently, Zeiner and Paredes (1978) have obtained racial differences in the circadian variation of ethanol metabolism; they found that a higher peak blood alcohol concentration was reached in the morning than in the afternoon among white male subjects, while for a male Native American group the peak blood alcohol concentration was lowest in the morning and highest at night.

LIBRIUM

Temporal variations have been found in the survival rate of rats to lethal doses of Librium (Marte and Halberg 1961), the amount required for a lethal dose depending upon the time of administration.

OPIATES

Several studies have found that a rat's responsivity to morphine is partly a function of chronobiological rhythms. For example, Morris and Lutsch (1969) observed diurnal rhythms in response to morphine analgesia; later, they discovered that the effects of morphine could be manipulated by changes in the lighting period (Lutsch and Morris 1971, 1972). More recently, Bornschein (1975) observed that the effective dose of morphine varied with the time of administration; morphine was most toxic at the end of the animal's active phase, and least toxic at the end of the animal's rest phase. Similarly, Bornschein et al. (1977) noted changes in the animal's central nervous system responsiveness to morphine; they detected a threefold difference in the efficacy of morphine as a function of time of day (i.e., morphine was 2.7 times more effective at 0300 hours than at 1500 hours). Unfortunately, there is very little research bearing on the relationship between chronobiological rhythms and human opiate use (e.g., Ghodse et al. 1977).

OPIATE ANTAGONISTS

It has been reported (Frederickson et al. 1977) that the administration of naloxone, a narcotic antagonist, will produce variable results in rats, depending upon the phase of circadian rhythm at administration.

Much of the previously cited research relating drug use to chronobiological factors has emphasized the administration of a drug during a specific time within the ongoing rhythmic period. Consequently, the experimental focus has been on how rhythmic activities affect the responsivity to a given drug. A complementary way of viewing the relationship between drug events and chronobiological events is to consider how the drug itself may affect the level of rhythmic functioning in the subject.

CHRONOBIOLOGY AND SELF-MEDICATION

If one views drug abuse as a possible form of self-medication, then it is conceivable that some drug use represents an attempt on the part of the user to induce artificially certain rhythmic patterns where none have been before, or perhaps to reestablish such patterns when they have been lost. For example, Orr (1976) has suggested that amphetamine use may represent an attempt by the drug user to get back to a regulated sleep-wakefulness schedule. Can the "uppers" and "downers" taken by many drug users be compared to the "ups" and "downs" of chronobiological rhythm periods? An additional possibility would be for the drug to establish a "limit cycle," in which the motivation for drug use would not simply be the acquisition of a particular rhythm, but an attempt to avoid going too high or too low within the rhythm; as such, the drug would serve as a regulating device.

Should this hypothesis prove relevant, future research, rather than studying only retrospective patterns of drug use (what drug was taken, how often it had been used in the past) should focus upon when a given drug (or drugs) is used (Sinnet and Morris 1977), inasmuch as the timing of administration of a particular drug may be as significant as many of the other variables.

In heroin addiction, for example, there is the increase in pleasure obtained after the injection, the gradual reduction of pleasure after several hours, the onset of unpleasant withdrawal symptoms, the injection of another dose of heroin, etc. Viewed in long-term chronobiological patterns, it seems possible that the heroin user might be taking heroin in an attempt to maintain some degree of rhythmicity in his or her physiological and psychological functioning.

As a final point, deaths from a heroin overdose might be due in part to when the heroin is taken; if injected at a time of maximal susceptibility within the chronobiological rhythm, the effect might be quite different (i.e., death) than if it were taken during a time of minimal susceptibility (i.e., survival).

Unfortunately, most chronobiological drug studies are bound to a relatively simplistic "time of day"; a more complex analysis arises from the possibility of "free running" rhythms that are not synchronized with the environmental cycles. In such cases, the subject will drift in and out of phase with the chronobiological clock, experiencing periodic "jet lag" discomfort. Perhaps narcotic addicts have such discomforts and use heroin in an attempt to synchronize their internal rhythms to the environment.

CHRONOBIOLOGY AND CONTROL

As chronobiological rhythms are related to drug effects, so are they implicated in a number of different psychiatric problems. Recently, behavioral rhythms have been observed in several schizophrenics (Reynolds et al. 1978), and circadian rhythm disorders have been investigated in manic-depressive patients (Kripke et al. 1978). One important implication of this research is the possibility that such psychiatric problems may have a biological basis related to rhythmic activity within the brain. Indeed, it has been found (Philipp and Marneros 1978) that some patients with endogenous depression are treated more effectively with a single large dose of an antidepressant than with three smaller doses throughout the day. Such findings suggest that there may be circadian fluctuations within the neurotransmitter system, thus making the depression more (or less) susceptible to chemical treatment. Obviously, there are not only variations in chronobiological rhythms, but in consciousness and psychological factors as well (Broughton 1975).

One hypothesis concerning the motivation for drug use (and abuse) is that drugs may be consumed in an effort to self-medicate (e.g., Mellinger 1978). This analysis is particularly attractive in light of the research on chronobiological rhythms, since it suggests that (1) if an individual cannot predict or control his or her chronobiological rhythms (e.g., manic depression) or (2) if the amplitude of the manic-depressive behavior exceeds normal limits, the person may resort to licit and/or illicit drugs in an attempt to establish some control over these fluctuating moods. Thus, heroin use may be viewed as a way of coping with psychological problems (Khantzian et al. 1974) or, more specifically, with particularly stressful situations as assessed by life change units (Duncan 1977).

This use of drugs to control possible aberrant chronobiological rhythms is an important concept, especially as related to the concept of learned helplessness (Seligman 1975). A considerable amount of research, both with animals and with humans, has suggested that exposure to unpredictable and uncontrollable events may interfere with the individual's ability subsequently to master a learning task, even if such future tasks are controllable. That is, the individual becomes psychologically "helpless."

One intriguing aspect of this research has been the theoretical linkage between helplessness and depression. It was assumed initially that helplessness might serve as a theoretical model of depression. Additional research, however (Huesmann 1978), has questioned the early concept of learned helplessness as a model of depression, and Seligman and his associates (Abramson et al. 1978) have recently reformulated the theory of learned helplessness to account for a wider range of cognitive processes (e.g., attribution). These modifications notwithstanding, the learned helplessness hypothesis is based primarily on learned experiences; if the evidence regarding chronobiological rhythms in depression is correct, however, then another phenomenon which might contribute to perceptions of helplessness would be the unpredictable and uncontrollable chronobiological rhythms that produce depression. As such, drugs may be used as agents of control (Hochhauser 1978a) which permit the individual user to exert some degree of internal control over his or her perceptions of helplessness.

Learned helplessness appears to play a role in alcohol and drug use (e.g., Sadava et al. 1978); moreover, the relationship between locus of control (Rotter 1966) and alcohol and/or drug use is one which has generated much research. Locus of control (whether one believes one's behavior to be internally or externally controlled) has been measured in a wide variety of drug-using populations (e.g., Plumb et al. 1975; Hall 1978): opiate addicts (Berzins and Ross 1973; Henik and Domino 1974; Obitz et al. 1974), alcoholics (Goss and Morosko 1970; Gozali and Sloan 1971; Oziel et al. 1972; Oziel and Obitz 1975; Obitz and Swanson 1976; Hinrichsen 1976; Weissbach et al. 1976; Rohsenow and O'Leary 1978a,b), and polydrug users (Segal 1974).

Such studies have often reported conflicting results. One reason for such discrepancies might be that the initial locus-of-control measure focused primarily on behavioral indices; it may be that a locus-of-control concept which takes into account other factors, such as health (e.g., Strickland 1978), may be more appropriate for alcohol and drug problems.

DISTINCTIONS BETWEEN DRUG USE, ABUSE, DEPENDENCY, AND ADDICTION

Assuming that drugs may be used as agents of control, it is argued that--

1. Drug use may represent an initial attempt to achieve some degree of internal control over perceptions of helplessness; moreover, drugs may be a relatively quick and effective means of obtaining such control, especially when other control measures are unavailable;

2. If a drug is used for control and is found effective, then its use will probably escalate, as the individual may develop a relatively predictable and controllable method of coping;

3. Dependency may develop if there are no other effective coping mechanisms available;

4. Depending upon the addictive liability of the drug, addiction may occur with continued use, as the physiological consequences of the drug (e.g., withdrawal symptoms) may eventually establish control over the user. At this point, addicts may seek treatment, since they are no longer using the drug for control; rather, they are being controlled by the drug.

SPECIAL PROBLEMS

ACCIDENTAL DEATH/SUICIDE

Research on chronobiological rhythms suggests that there may be periods of minimal and maximal sensitivity to the lethal dose of a drug; consequently, problems such as heroin-overdose deaths or barbiturate-overdose deaths may be related to when (in the rhythmic cycle) a given drug is taken.

PSYCHOPATHOLOGY

It is difficult to determine if psychopathological behaviors (e.g., schizophrenia, manic-depressive behavior, etc.) lead to drug use (perhaps in an attempt to self-medicate such problems), or whether continued drug use (perhaps through changes in chronobiological rhythms associated with psychopathology) may cause subsequent psychopathology. Relationships between chronobiology, psychopathology, and drug abuse require additional clarification.

ADOLESCENTS

Significant psychological and physiological changes occur during adolescence, and the effect of drugs upon such developmental changes is largely unknown (Hochhauser 1978b). Studies of adolescent drug abuse suggest, however, that depression is often a characteristic variable associated with drug abuse (Braucht et al. 1973) and that the inability to cope with stressful experiences may play a significant role in the development of drug dependence (Duncan 1977). The interrelationship between changing chronobiological rhythms, perceptions of internal control, and drug abuse must be more clearly defined.

THE ELDERLY

During the period of old age, there are often significant environmental changes (e.g., retirement, loss of a spouse, relocation) which may make the individual more helpless and possibly more susceptible to drugs as a way of coping. Moreover, important physiological changes are also taking place (e.g., reduced metabolism, changes in sleep patterns, hormone reduction) which may substantially affect chronobiological rhythms, thus making the elderly person more susceptible to drug effects.

A Bioanthropological Overview of Addiction

Doris F. Jonas, Ph.D.
A. David Jonas, M.D.

Sometimes a collaboration between individuals occupied in separate biological fields and the application of understandings from one field to the other leads to felicitous insights and new perspectives. Our own experience has encompassed studies of the evolutionary bases of human behavior on the one hand and two decades of clinical experience with addicts of various kinds (and their families) on the other.

Departing from the conventional view that addiction arises solely from the life history of an individual or out of an obscure chemical imbalance, we have come to a formulation of the problem, rather, as one of the effects of group mechanisms upon the individual. The dynamics residing within the entity we call a society affect all its members. There are those who can adapt themselves to group requirements and others who in some or many ways cannot. This applies to all social groups of all creatures, whether animal or human.

Very frequently manifestations that appear to us to be peculiarly human, when compared with the patterns of life of other animals, come to be thought of as due to our cultural endowment or to our specific civilization and as phenomena that therefore define a separation between our species and all others. Language, love, politics, and the care of the sick are among many human propensities and predilections that come into this category. Yet everything human has its origin in an animal past, and such a view tends to prevent certain aspects of human behavior from being seen in a context of overall natural patterns, hindering full understanding of their significance.

The problem of addiction is certainly a human one, and it has not been thought of in terms of comparative behavior. The reason is simple.

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Addiction does not occur in a natural state. Laboratory animals may be induced artificially to become addicted to most of the substances on which a human being may become physiologically or psychologically dependent, but this does not happen in feral conditions. Nor, on the other hand, is the presence of "mind" in humans an explanation for the different behavior, since animals with no advanced neocortical development can become addicted in laboratory conditions.

Beyond the failure to view addiction in terms of overall natural processes--or perhaps a part of that failure--is the tendency we have had to ask questions about the "whys" of addiction in terms only of an addicted individual's life. We ask what personal problems led him to turn to drugs or alcohol for relief. Even if we take a step further and examine the social background of the addict, seeking a cause for his problems on a wider basis, this larger dimension is considered relevant only in terms of its effect on the individual; and so the answers we find, like the questions we pose, remain individual oriented. Since the study of the individual is the domain of the psychiatrist, the problems of addiction have come to be accepted as within his province.

A further question that must arise, of course, is how it can happen that addiction can arise biologically. This question has been asked by some, and answers to it have been sought in the physiology of the nervous system. But this step again focuses on the individual, even when investigations are pursued into his genetic background; and so, while the question is right, the approach to answering it is limiting, since it leads no further than the previous ones--to the individual.

Yet it is indeed in neurophysiology that we may begin to find clues to the larger pattern. The nervous system is more than a recipient of stimuli and regulator of an organism's behavior. It is a repository of reflex responses that connect the individual to his phylogenetic past and is also a regulator of interactions between the individual and the present society of which he is a part. What we call social pressures are conveyed to an individual, and he reacts to them, not only through his understanding but also through direct neural responses, so that in this sense the nervous system is the mediator between an individual and a society in a way analogous to the role of the hormones in mediating between the behavior of cells and the needs of the whole organism. In binding individuals to the needs of their societies, their nervous systems serve to integrate group well-being. To see this clearly, it is helpful to look at some group mechanisms in the breeding groups of other species, and we may then see how these throw light on otherwise puzzling human behavior.

The pioneer experiments of R.N. Chapman (1928) showed that, in an enclosed environment in which the nutrient medium was a layer of flour two centimeters deep, a steady ceiling population of the flour beetle (Tribolium confusum) would ultimately be obtained. An experimentally repeatable, almost constant density of individuals per gram of flour was finally arrived at, whether the culture was started with one pair of adults or many pairs or whether the volume of flour was small or large. Of many subsequent workers, D.S. MacLagan (1962) performed parallel experiments with Tribolium and Sitophilus, the grain weevil. He found that there was a drop in the number of eggs laid per female associated with crowding, and he concluded that natural populations as well as experimental ones "automatically check their own increase by virtue of this density effect, and that the organism itself imposes the ultimate limit to its own abundance when all other factors (biotic and physical) have failed" (p. 452). Both Tribolium confusum and its close relative T. castaneum, when adult, have glands in the thorax and abdomen that produce an irritant gas that P. Alexander and D.H.R. Barton (1943) identified as ethylquinone. The glands are stimulated to liberate this gas by disturbance and crowding. In crystalline form, it is lethal to first-instar larvae; as a gas it induces developmental abnormalities in late larvae and pupae, and it probably has a depressing effect on the well-being of the adults (Roth and Howland 1958).

The now classic experiments of C.M. Breder and C.W. Coates (1932) showed that, in tanks containing an equal volume of water, whether a single gravid female or a number of guppies (Labistes reticulatus) were placed in them, it took only about 20 weeks for the same constant population of nine or ten fish to be reached in each. Surplus individuals were cannibalized.

Tadpoles overcrowded in their tanks excrete into the water metabolites that have the effect of stunting growth until the smaller individuals die off and the population is adjusted to an uncrowded condition (Richard 1958).

Socially induced mortality occurs also in birds, and among them social status becomes a factor. The most subordinate members of a population may be inhibited from breeding at all. Those a little higher in rank may achieve a nest and mate and perhaps even eggs, but when environmental conditions impose a necessity for a reduction in the number of young birds being reared, the stress falls more tellingly on them than on better-established and higher-ranking members of the community. A wide variety of species-specific mechanisms are brought into play, from reduced egg production or the destruction of eggs to the killing of young, but for our present purpose it is sufficient to note that the reduction of the threshold of resistance to parasitic infestation is one of the many manifestations of crowding stress that have a homeostatic effect. D. Lack (1954, chapter 54), in an extensive review of mortality attributable to disease in birds, noted that, when they are in good condition, such birds as the red grouse (Lagopus lagopus) can carry a considerable burden of internal parasites without injury but that, if the quality of their staple food plant is affected by harsh weather or by unusually extensive damage by the heather beetle, then the birds' threshold of resistance is lowered so that the lower ranking appear to die of parasitic disease.

The element of status in the survival of birds in crowded conditions was noted in an extreme manifestation by A.A. Allen (1934). He observed in a captive group of ruffed grouse (Bonasa umbellus L.) what he called an intimidation display. "A bird that has been completely subjugated . . . is subject to attack from every other bird in the enclosure. He has developed an inferiorism and usually, unless removed, he remains in a corner until he dies, not from mechanical injury nor from starvation, but from some sort of nervous shock, and death is likely to occur within 24 hours." V.C. Wynne-Edwards (1962) has commented that the function of hierarchy is to identify surplus individuals whenever environmental necessities require a reduction of population.

Wild mammals respond no less than other creatures to population density. In North Wales Brambell and his associates made the discovery in the rabbit (Oryctolagus cuniculus) that an average of 64 percent of embryos conceived perish before birth, usually by the twelfth day of pregnancy. The arrested embryos are not aborted, but their tissue is broken down and resorbed by the uterus, leaving nothing but an impermanent scar (Thompson and Worden 1956, pp. 112-113). The percentage of embryos resorbed is responsive to environmental conditions.

These are but arbitrary examples (that could be multiplied almost endlessly) taken from insect, fish, amphibian, avian, and mammalian societies, to give some idea of the types of social mechanisms to which we are referring. V.C. Wynne-Edwards states that there can remain no doubt that populations are effectively self-limiting, "and the inference must be very strong that selection has perfected the adaptations so that population densities always tend to balance themselves at the optimum level" (1962, p. 498). In his encyclopedic work, he has shown that there is probably no species that does not have some built-in method of population control that effectively regulates the density of its breeding groups or societies. Indeed it is clear that this must be so, since any population that failed to effect this regulation would very soon strip its habitat of the resources necessary for its sustenance and thus promote its own extinction.

For each species, the range of "personal space" required by individuals varies, but the work of such researchers as J.B. Calhoun (1962, 1963) has made us aware of the gross distortions of normal behavior that occur when this space requirement is infringed. The more enlightened curators of zoos have recently come to recognize the modifying effects on the natural behavior of animals of cages that confine their living space too closely, and we ourselves have become aware of our own need for "personal space" and of human responses ranging from mild irritation all the way to violent aggression that may occur when it is invaded.

The potential for these responses is carried genetically in all species, and H. Selye (1950) has shown that social stress can have depressing and injurious effects on the animal body just as severe as those produced by disease, hunger, or fatigue. But the mediating agency between the environment and the individual is the nervous system, in that the nervous system not only brings awareness of population pressures to the individual but also sets in motion the adaptive responses, whether physiological or behavioral.

We may now ask ourselves, Where does the human being fit into this pattern? It is evident that no natural design as universal as the response against crowding in the interlocking network of mechanisms that exist in the interest of species viability and survival can possibly be without significance or consequence in our own. And, indeed, into quite recent times many human practices, including infanticide, gerontocide, social requirements governing marriage, taboos governing child spacing, and so on, have in effect achieved population regulation by cultural means as efficient as the biological mechanisms of other species (Carr-Saunders 1926). Many observers have noted that tribal groups relatively out of contact with modern life had maintained stable populations over long ages. If this is the case, we must concede that it is hardly possible for modern societies of man to be entirely free not only of vestiges of earlier mechanisms of population control but also of some that operate in our own societies and in our own times.

It is indeed probable that such mechanisms in fact exist but that they appear in the guise of cultural practices or individual characteriological idiosyncrasies that themselves become the subject of attention and so obscure awareness of the larger function they serve. This then interferes with our realization that powerful biological mechanisms operate on a group level in our culturally and technologically modified societies, no less than in all societies in the rest of nature. Doubtless the individuals living in a tribal society would see the observance of their taboos affecting, say, child spacing as acts of conformance with their customary cultural practices and would not relate it to similar behavior in many animal groups. Would it be possible for us, who are at a distance and not involved with them, to see those practices in terms of their overall biological effect? May we then not ask ourselves whether some of the social manifestations we see in our own communities and consider to be culturally conditioned may not also fit into larger biological patterns?

We believe that this is so and that addiction comes into this category.

From the point of view of the individual concerned and of those who attempt to relieve him of his habit, addiction is an unmitigated ill. The initial gratifications derived from the drug, alcohol, or smoke frequently fade as an organism becomes habituated and relatively immune to their effects, and the addict is then driven to larger and more frequent intake in order to capture the initial pleasurable feeling. In this process a crescendo of ills besets him. His health declines, and his social adjustment is increasingly disrupted, until eventually he secedes from his community altogether and lives, so to speak, on its fringes, either as a member of a deviant group or as a solitary outcast. His fertility is frequently impaired and his genetic endowment thus often eliminated from the gene pool of his population.

The personal involvement of medical workers in general and of psychiatrists in particular in attempts to help these individual reverse their downward drift is a factor in the failure to see the overall pattern. Given our current attitudes about what constitutes sickness and health, focused as they are on the well-being of individuals, perhaps it takes a quantum jump in our thinking to recognize the undoubted fact that a whole breeding group or society is an evolutionary unit in its own right and must also maintain good health if it is to survive. On the health of its breeding groups the viability of an entire species depends.

Here we must note that the general understanding of the principle of natural selection encompasses a misconception: it is that the genes of fit individuals survive, while those of less fit individuals are weeded out over time. The fact is a little different, but that small difference puts a completely other complexion on the matter. It is that the principle of natural selection does not operate at the level of the individual but at the level of the breeding population as a whole.

At this level it is easy to see that, if every individual within a breeding population were exquisitely adapted to its current environment, then any external change in that environment would wipe out the total population. It is therefore an adaptive character of populations that they carry in their total gene pool several variations of individual traits, including some that appear currently maladaptive at any given time.

The best-known example that illustrates this fact is the population of moths whose white wings are peppered with grey-to-black speckles. In an earlier period of pristine atmosphere, the whiter moths

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predominated numerically in the population. As industrial pollution darkened the trunks and branches of the trees on which they settled, however, the whiter moths became conspicuous to their predators and were picked off in proportionately larger numbers, until at the present time the populations of this species are predominantly of the darker colored variety (Kettlewell 1973). Should human antipollution endeavors now prevail, on the other hand, it is likely that the lightly speckled moths will again come into their own. Thus it will be seen clearly that, for this moth population as a whole, it is adaptive for it to carry, if recessively, in all generations a potential for alternative coloration that at any particular time is ill adapted--indeed, dangerous--for the individuals that carry it. Without this potential for alternative coloration, the destiny of all the moths would be at the mercy of the vagaries of their habitat, and their species life would be very short.

Variation of color in the moths, of course, is an anatomical character. In our own species from its earliest emergence, however, behavior has been as determinative of survival as morphology and a spectrum of behavioral traits therefore as important to the viability of our species as a whole as morphological variety. It would seem reasonable to assume that a range of sensitivity to external stimuli and group pressures would have its place in this context and that those who take and become addicted to narcotics or stimulants in our present societies are among the more sensitive to such stimuli and pressures. In other eras or in other circumstances, such hypersensitivity might well have been and may well yet become a species-saving characteristic. Yet in the universal ability of all groups of all species to reproduce a larger number of offspring than they can sustain and the tendency of all groups to do so lies the necessity that mechanisms must exist to ensure that at all times all populations are, so to speak, thinned out. Inevitably it is those individuals who are currently of the wrong color, too tall or too short, too slow or too fast, or too little or too acutely sensitive who are the ones who become sacrifices to the need of the group to adjust its density. Those individuals then, depending on their species, fall prey to predators; to reduced resistance to parasites; to elimination by others before birth, in the perinatal period, or later; or to self-elimination as a result of social pressures.

Within the context of the concept of the well-being of the larger entity, the whole society--its necessity to produce more recruits than it needs so that it may survive in case of calamity and therefore its equal necessity to eliminate its surplus--we discover an overall design into which several conditions that have proved puzzling to investigators may well fit. For example, no more than the potential addict does the schizophrenic show any organic impairment that could classify his condition as a disease state; and, like the addict, the schizophrenic is also hypersensitive to stimuli and to social signs--above all, to crowding. It would appear probable that both the addict and the schizophrenic are heirs to genetically carried behavioral responses that were supremely adaptive in earlier phases of mankind's phylogeny when human groups were small, when social stimuli were infinitely fewer, and when a creature's awareness had to be constantly alert and finely attuned to sensing danger from the environment in order to survive (Jonas and Jonas 1975).

A nervous system so exquisitely adapted to perceiving the minutest changes in environmental signals clearly becomes overwhelmed and produces dysphoria when its carrier must exist among the exponentially increased social stimuli of a modern environment. Those individuals whose nervous systems are less sensitive and who would surely be at peril in, say, a forest habitat today are better adapted to our more crowded living conditions. The more sensitive can only attempt to ease their discomfort by blunting their perceptions with alcohol or depressive drugs or, alternatively, by using consciousness-altering drugs to transport their senses from the dysphoric world in which they live to private worlds of their own.

In the conduct of group therapy among addicts in connection with the U.S. Army's detoxification and rehabilitation program, we have observed in practice that the members of these groups consistently show difficulty in relating to each other. They are plainly uncomfortable being together in a group, facing each other, and experiencing the social stimuli implicit in any close human gathering. Even with those who attempt to dissipate their discomfort in drunkenness, it is apparent that their conviviality or boisterousness does not lead them toward closer interactions with others but is, rather, a device that shields them from it. The alcoholics' own belief that they drink to relax their sense of tension is misleading. What they are doing is blunting their perceptions so that they no longer respond to those signals from others or from within themselves that cause them feelings of embarrassment, inadequacy, or shame when they are sober. In doing so they eventually effect a general leveling of their mood, and then, paradoxically, the absence of affect itself produces an unhedonistic and dysphoric state.

Today addicts of whatever kind form a sizable segment of the broad spectrum of our population. As such they provide an available pool of individuals that is readily amenable to a reduction of population density by reason of their potential for reproductive failure. That is to say that, although the ability to reproduce may not be impaired in the individual case of any particular addict, nevertheless the addiction of itself renders successful mating less probable than for the nonaddictive person. Our clinical experience has been that, even where successful mating does occur among addicts, the problems which cause and are a result of their habit tend to make them less able to rear their children in a socially satisfactory manner. The children of addicted parents encounter more problems in social adjustment than most of their contemporaries, making subsequent successful mating difficult for them in their turn. Thus the potential for eventual reproductive impairment exists among addicts, even if perhaps extending over several generations. And in this vital social function they may have replaced that pool of children who in each generation in earlier times were eliminated by childhood diseases but who are now saved by medical intervention. (The semipermanent state of warfare which is characteristic of our species has not been an element in stabilizing populations because, until our own time, it has not reduced the female population. But in earlier times poor hygiene, productive as it was of plague diseases among adults as well as adding to the toll of child mortality, was also a factor in the automatic spacing of populations whenever they became too dense.) The large increase in stress diseases in modern times and of stress responses including anomie, accident proneness, a possible increase in homosexuality, addiction, and so on are today probably also aspects of the operation of this group mechanism.

This bioanthropological overview of the adaptive significance of self-eliminatory behaviors places these phenomena within the framework of a context wider than that to which we are accustomed in our professional concern for the well-being of the individual. In the process, it forces upon us the necessity of contemplating ethicomoral issues--of making a decision as to whether our primary duty is to an individual or to our society. To offer an analogy, it is as though a surgeon were obliged to decide whether to rescue an organ to the possible detriment of the whole organism. It is a quandary that is currently becoming apparent to widening circles of responsible scientists. Our comparatively recent awareness of the limited nature of our biosphere and of the closely interlocked necessities both of inanimate material and of all forms of life that sustain and are sustained by it enforces a reevaluation of many, perhaps most, of our existing values. This awareness has produced a growing number of people committed to such concerns as environmental quality, the preservation of endangered species, the control of population, the wider effects of pesticides, birth control, and so on.[1]

In the present-day liberal political and philosophical climate, the interest of the individual reigns supreme. The idea that a society might sacrifice certain of its individuals for the greater good of the whole is anathema, and we cannot dissociate ourselves from the reality of the prevailing morality. We are of our times, and it is our deepest desire to improve the lot of each and every human being. This does not preclude the possibility that at some future time other moralities may supervene.

Addiction and similarly dysfunctional social behavior, then, constitute pathways along which certain individuals move toward an exit from the gene pools of their populations, and the attempt to halt their departure and to encourage them to reverse their course fosters a biological paradox.

We have seen that the phylogenetic preservation of variety within a population, whether of anatomy or behavior, does not only permit a group to survive changes in its environment. It also provides a group with a certain proportion of individuals that it may safely discard whenever its density exceeds an optimum. Thus we recognize that those who become addictive do not have within themselves the behavioral repertoire that will enable them to move successfully into the mainstream of the life of their group. They are, so to speak, biologically designed to fulfill a different role.

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[1] We might note that, while it is reasonable to assume that conditions involving hypersensitivity to the environment may in the past have had and may yet have adaptive elements, there are genetically determined physiological variations (such as juvenile diabetes mellitus, among numerous other genetic abnormalities) that would seem to be nonadaptive in any circumstances. Such variations as these would be eliminated from a population in a natural state simply by the death before reaching reproductive age of the individuals carrying them. Given the orientation of our Western societies, however, we search for remedies that will allow so-afflicted individuals to live out their lives and perhaps to procreate. The heritable element of their disability may be masked through several subsequent generations, depending upon several factors, including the genetic endowment of those with whom succeeding generations mate. It is therefore usually extremely difficult, if not impossible, to determine precisely the stage at which maladaptive traits carried genetically are finally eliminated from the gene pool of a human population, although, by their nature, this must eventually occur if the society is to continue in existence.

In our individual-oriented, liberal society, such a concept, however, is unacceptable. Humanitarian principles impel concerned professionals to devote all available resources to the task of rehabilitation. As humanitarians we ourselves (the authors) are also involved in such an endeavor. As biologists, however, we have to see that a remedy for addiction does not lie in the realm of treatment for the individual but, rather, in a broader understanding of the ecological needs of the society as a whole. Unless we see to it that steps are taken to prevent overpopulation, if not addiction then other social mechanisms will emerge that will have the effect of eliminating individuals, and a new set of problems will then have to be faced.

Emerging Concepts Concerning Drug Abuse

William R. Martin, M.D.

PHARMACOLOGIC REDUNDANCY

When I first arrived at the Addiction Research Center in the fall of 1957, I knew little about problems of drug abuse and of the pharmacology of abused drugs. I came to the Addiction Research Center with some knowledge of neuropharmacology and neurotransmitters, and a high level of interest in drug receptor interactions. I also had an interest in the limbic cortex and its interactions with the autonomic nervous system and the EEG. I was particularly interested at that time in the role of both descending and ascending catecholaminergic and cholinergic paths in EEG activation and vasomotor responses, and in characterizing alterations of physiologic responses with both stimulus response and dose response parameters.

Results that I obtained with these studies of atropine led me to conceive of the principle of pharmacologic redundancy as a mechanism of both tolerance and dependence (Martin and Eades 1960). Subsequently, I generalized my thoughts concerning redundant processes in the central nervous system (Martin 1970) and entertained the possibility that presynaptic elements might contain more than one transmitter and that the postsynaptic neuron might have more than one type of receptor. Further, our data on the effects of atropine on EEG activation and vasomotor responses suggested that parallel pathways contained a variety of synaptic mechanisms and that when one synaptic process was impaired, another parallel process using different synaptic mechanisms could assume the function of the impaired synaptic system. Subsequently data were obtained for the cotransmitters by others.

HOMEOSTASIS

Himmelsbach's (1943) concept of compensatory homeostatic mechanisms as an explanation for both tolerance and dependence was the basis of several experiments, and we were able to show that indeed homeostatic mechanisms played a role in both acute and chronic tolerance and physical dependence. The accumulation of carbon dioxide was shown to be one of the mechanisms involved in the acute diminution of morphine's depressant effects on respiration in the acute decerebrate cat (Martin and Eisenman 1962), and panting induced by morphine in the dog was due to an alteration of the temperature set point. Further, dissipation of body heat was responsible for acute tolerance to morphine-induced panting (Martin 1968). We further demonstrated in patients who were physically dependent on morphine that the partial pressure of carbon dioxide minute-volume stimulus response curve was shifted to the left indicating that the respiratory set point had been sensitized to CO_2 as a consequence of chronic morphine administration. This, to my knowledge, was the first experimental evidence that a homeostatic set point could be altered as the consequence of chronic administration of narcotics (Martin et al. 1968).

MULTIPLE OPIOID RECEPTORS

In 1967, I initiated studies reevaluating the abuse potentiality of the mixed agonists/antagonists, cyclazocine and nalorphine (Martin et al. 1965; Martin and Gorodetzky 1965), which were to have far-reaching impacts. We also initiated studies with a new antagonist with questionable analgesic activity, naloxone (Jasinski et al. 1967). As a consequence of the study of naloxone, which proved to be an antagonist without agonistic activity, and with the results that we obtained with cyclazocine and nalorphine, we made several speculations (Martin 1967):

1. We felt that for the first time, unequivocal evidence had been obtained that morphine-like drugs were acting as agonists.

2. The action of mixed agonist/antagonists such as cyclazocine and nalorphine could not be explained on the basis of their interacting with a single (morphine) receptor and we postulated that there was another receptor (nalorphine).

3. We felt that some of the agonists/antagonists were acting as partial agonists.

4. The possibility of a naturally occurring agonist was entertained.

We reasoned,

> In attempting to explain the contrastimulatory properties of the opioid antagonist, one is forced to reconsider the nature of the agonistic actions of narcotic analgesics. One can assume, for argument sake, that opioids mimic a naturally ongoing process. If this hypothesis is true, then it would not be unreasonable to assume that those antagonists with low intrinsic activity would antagonize not only morphine-induced activity, but the naturally ongoing activity that is similar in nature to the effects of morphine, with the result that an antimorphine effect would become manifest.
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> (Martin 1967, p. 508)

For a time, I became involved in other pharmacologic problems, principally the issue of whether tryptamine was a neurotransmitter, and did not return to the issue of multiple opioid receptors again until Paul

Gilbert joined my laboratory as a graduate student. In the interim, however, Dr. Jasinski and I reinvestigated the abuse potentiality of pentazocine (Jasinski et al. 1970). In these studies we found that although pentazocine appeared to produce morphine-like subjective effects in small to moderate doses, it would not suppress the morphine abstinence syndrome. This observation disturbed me and raised serious questions concerning the two-receptor theory of opioid action. When Gilbert initiated his thesis work (Gilbert and Martin 1976), we decided to reinvestigate the pharmacology of N-allylnormetazocine (SKF 10047), a benzmorphan derivative that had been studied by Keats and Telford (1964) and found to have a high degree of psychotomimetic and dysphoric activity. We had also known that high doses of naloxone were required to antagonize the effects of cyclazocine, in both the dog (McClane and Martin 1967) and in humans (Jasinski et al. 1968). We also studied ketocyclazocine and ethylketocyclazocine, which on the basis of work on the guinea pig ileum appeared to be strong agonists devoid of antagonist activity for which naloxone was a relatively impotent antagonist (Kosterlitz et al. 1973). From the results of these studies, it became quite apparent that we were mistaken in thinking that there were only two opioid receptors, and it was thus necessary to postulate a third receptor. We renamed the receptors μ (for morphine), κ (for ketocyclazocine), and σ (for SKF 10047) and felt that these three receptors were respectively responsible for the euphorigenic, sedative, and dysphoric actions of the mixed agonists/antagonists. We also had obtained convincing evidence that buprenorphine was a partial agonist of morphine in the dog (Martin et al. 1976). Thus, it became apparent that the term agonist/antagonist had two meanings: (1) a partial agonist and (2) agonistic action at one receptor and antagonist or partial agonistic action at another receptor. These were the first receptors that were identified and differentiated on the basis of clinical and neuropharmacologic studies.

NARCOTIC ANTAGONIST IN THE TREATMENT OF HEROIN DEPENDENCE

In our studies of cyclazocine and nalorphine (Martin et al. 1965; Martin and Gorodetzky 1965) we observed that tolerance developed to the subjective effects produced by cyclazocine and nalorphine and that following withdrawal of cyclazocine-dependent subjects, the abstinence syndrome had a long latency of onset. Based on these observations and theoretical considerations, we speculated that tolerance developed to cyclazocine's agonistic actions but not its antagonistic effect. We subsequently confirmed these speculations. I was privileged in being at the Addiction Research Center at a time when Dr. Abraham Wikler was evolving his ideas of conditioned abstinence and conditioned drug-seeking behavior. We considered the possibility that if patients were made tolerant to the agonistic effects of cyclazocine, its prevailing antagonistic effects might allow the extinction of these two types of conditioning. The effects of heroin would be abolished, and thus could not be reinforcing by virtue of its producing feelings of well-being or inducing physical dependence. In any event, we did stabilize patients on high doses of cyclazocine and found that it not only blocked the effects of large doses of morphine and heroin but also prevented subjects from becoming physically dependent when morphine was administered chronically in high doses (Martin et al. 1966). Cyclazocine was given a clinical trial by Dr. Alfred Freedman of New York Medical

College and Dr. Jerome Jaffe, then of Albert Einstein College of Medicine. Both initiated studies of the utility of antagonist therapy in heroin addicts. Cyclazocine was disappointing in that it was not well accepted by addicts. In this regard, it should be mentioned that the administration, clinical investigators, and scientists of Sterling Winthrop were supportive of these investigations. It was felt that perhaps the dysphoric effects of cyclazocine might have been responsible for the lack of acceptance of it by addicts. On the basis of our studies with naloxone and cyclazocine, we speculated that naltrexone, which is chemically related to both naloxone and cyclazocine, might be a pure antagonist with a long duration of action. Indeed, the basic studies of Blumberg et al. (1967) indicated that it was a pure antagonist. Through the cooperation of Drs. Harold Blumberg, Ralph Jacobson, and Irwin Pachter, all then of Endo Pharmaceutical, we were able to initiate studies with naltrexone in humans and found indeed that it was a pure antagonist and that it had a sufficiently long duration of action to produce a high degree of antagonism of morphine when administered once a day orally.

Indeed, naltrexone has turned out to be a pure antagonist which has a long duration of action. It should be introduced into clinical medicine as the drug of choice for the treatment of narcotic overdose. In addition, it is a most satisfactory drug for antagonist therapy of heroin dependence.

PROTRACTED ABSTINENCE

In the early 1960s, at a time when Dr. Wikler was well into his studies of conditioned abstinence in the rat and at a time when Dr. Eisenman, Mrs. Sloan, and I were trying to dissect out the role of catecholamines in the morphine abstinence syndrome, it became apparent to us that many of the dimensions of tolerance and physical dependence on morphine in the rat were not well established, such as the rate of onset and particularly the duration of the abstinence syndrome (Martin et al. 1963). We thus initiated a study of morphine dependence in the rat and, to our surprise, found that the abstinence syndrome had two phases, an early and a late one, that were quite different. Although I maintained an interest in this problem, I did not return to it for several years. In 1967, we initiated a long-term reinvestigation of morphine dependence in humans (Martin and Jasinski 1969) and found that indeed humans also exhibited both an early and a protracted abstinence syndrome. However, the signs of protracted abstinence syndrome were small in magnitude and, although demonstrable in an experimental setting using a paired comparison, could not be identified or diagnosed on the basis of physiologic abnormalities in a clinical setting. With the introduction of methadone maintenance, it was decided to reinvestigate both the short- and the long-term effects of methadone maintenance under carefully controlled experimental conditions. Previous studies of protracted abstinence were extended by making three additional measures: (1) the psychometric changes that occur during a cycle of addiction, (2) the effects of a cycle of addiction on EEG and sleep, and (3) the effects of addiction on hormonal function. By far the most exciting results that were obtained were with regard to the psychologic changes. It was found that during chronic methadone administration negative feeling states prevailed and that these were exacerbated and persisted through both early abstinence and protracted abstinence (Martin et al. 1973). We then initiated study of protracted abstinence in the dog and extended our observations by determining the responsivity to nociceptive stimuli during a cycle of morphine dependence (Martin et al. 1974). In these studies, it was found that the dog also exhibited a protracted abstinence syndrome and that during protracted abstinence responsivity to strong nociceptive stimuli was enhanced.

THE PSYCHOPATHOLOGY OF THE NARCOTIC ADDICT

The results we obtained in humans and in the dog during protracted abstinence suggested that protracted abstinence was associated with an exacerbation of feelings of hypophoria and that these feelings of hypophoria might be associated with an increased need state.

These concepts of an affective state that was present in addicts became clarified. In my clinical experience with addicts who had participated in studies on the ward of the Addiction Research Center, I recognized a number of diatheses, the most prominent of which were feelings of poor self-image and unpopularity. Several investigators had observed that drug abusers had had elevations on the depression and the psychopathic deviate scales of the MMPI, yet on the basis of experiences on the ward of the Addiction Research Center few patients showed any signs or symptoms commonly associated with depression. Table 1 contrasts the feelings of euphoria, hypophoria, and depression. As can be seen, hypophoria is in many areas the polar opposite of euphoria, being associated with feelings of unpopularity, being unappreciated, ineptness, and inefficiency, whereas patients under the influence of euphoria-producing drugs such as morphine-like narcotic analgesics, amphetamine-like agents, LSD-like hallucinogens, and barbiturates feel popular, liked, appreciated, competent, and efficient. However, patients who have feelings of hypophoria can readily be differentiated from depressed patients in that they feel hopeful, worthy, can experience joy, can laugh, and feel guiltless. It became apparent that more information was needed to establish the concept of hypophoria as a unique and pathologic affective state and to begin speculations about

TABLE 1.—Characteristics of euphoric, hypophoric, and depressive feelings

Euphoria	Hypophoria	Depression
Popular	Unpopular	
Liked		
Appreciated	Unappreciated	
Competent	Inept	
Efficient	Inefficient	
Hopeful	Hopeful	Hopeless
Worthy	Worthy	Unworthy
Can experience joy	Can experience joy	Cannot experience joy
Can laugh	Can laugh	Cannot laugh
	Guiltless	Guilty

the nature of this hypophoria. Our studies on protracted abstinence had already indicated that long-term exposure to opiates gave rise to persisting and enhanced hypophoric feelings. We felt there was some evidence that suggested that these feelings might be related in some way to exaggerated need states which in turn were related to increased egocentricity. Hypophoria, exaggerated need states, and egocentricity increase the probability that individuals will have antisocial feelings and exhibit impulsivity. With this theoretical basis, a maturation scale was constructed that had items that were related to egocentricity, characterized by selfishness, inability to love, and callousness; impulsive behavior, characterized by thoughtlessness and uninhibited behavior; a need scale, related to sexual desires, hunger, body health, pain, and general wanting; a hypophoria scale, related to a negative perception of life, of poor self-image, feelings of being disrespected, disapproved of, and unappreciated, as well as feelings of ineffeciency and ineptness, withdrawal from competition, worry, and anger; and finally an antisocial scale consisting of items relating to antisocial feelings, feelings of nonconformity, poor judgment, and lack of social concern (Martin et al. 1977).

To study further the possibility that addicts and alcoholics might have exaggerated need states, we compared a group of alcoholics and addict prisoners with a group of nonsociopathic control subjects. The maturation scale and MMPI was administered to these subjects and a detailed history of antisocial behavior was obtained. In addition, plasma levels of follicle-stimulating and luteinizing hormones and testosterone were measured. It was found that the alcoholics, prisoners, and addicts had significantly elevated levels of luteinizing hormones and testosterone as well as significant elevations on the impulsivity, egocentricity, need, hypophoria, sociopathy, and maturation scales. These findings were supportive of the concept of exaggerated need states and of an affective disorder being of importance in drug abusers and alcoholics and that persons with a character disorder which manifested itself in an antisocial personality could have a biologic pathology.

NEUROTRANSMITTERS AND SUBJECTIVE STATE

Part of the Addiction Research Center's effort was to develop predictors of the abuse potential of psychoactive drugs. Drs. Harris Hill and Charles Haertzen developed a 550-item questionnaire that was especially useful in identifying and characterizing the subjective effects of drugs. Much of this work has been summarized by Haertzen (1966). Among the scales that were developed by Haertzen, the MBG scale (morphine benzedrine group scale) proved to be the most useful measure of the euphorigenic actions of drugs. Many items on this scale related to feelings of well-being, popularity, and efficiency, and in this regard were the polar opposites of the hypophoric subjective state. Amphetamine (Martin et al. 1971), narcotic analgesics (Jasinski et al. 1971), and pentobarbital (McClane and Martin 1976) caused dose-related elevations of MBG scale scores. This information was interpreted as indicating that morphine, amphetamine, and pentobarbital may be drugs that were used by patients as an antidote for their hypophoric feelings and to produce feelings of well-being.

Other drugs that will produce feelings of well-being include the LSD-like hallucinogens. A large number of investigators have demonstrated that many of the actions of the amphetamine-like drugs are attributable to their ability to release dopamine. The narcotic analgesics are thought to mimic the enkephalins and endorphins. The LSD-like hallucinogens act both as serotoninergic and tryptaminergic agonists. Benzodiazepines, which also produce feelings of well-being, are thought to interact with a brain receptor; however, a natural agonist has not been identified. Thus there is reason to believe that there is a neurochemistry and neurophysiology of euphoria and that a variety of neurotransmitters, including catecholamines; the endorphins; the enkephalins; and the indoleamines, serotonin and tryptamine, may all play a role in maintaining mood. Further deficiencies of these neurotransmitters may give rise to feelings of hypophoria.

CONCLUSIONS

It is now apparent that the brain has a variety of receptors and several neurotransmitters that are involved in feelings of well-being. Further many addicts and alcoholics have an affective disorder, hypophoria, that appears to be the polar opposite of feelings of well-being produced by drugs of abuse. The pathophysiology of hypophoria is not known. A deficiency of neurotransmitters that are involved in feelings of well-being is a reasonable hypothesis that should be testable. It is known that the protracted abstinence syndrome, associated with morphine physical dependence, is characterized by an exacerbation of feelings of hypophoria. Genetic and heredity factors may also be of importance. Further, hypophoria may have a reactive component, possibly related to exaggerated needs and drives particularly during adolescence and young adulthood, a time when social coping skills are not fully developed.

Thus work on problems of addiction over some 20 years has led to some interesting speculations about the psychopathology and pathophysiology of drug abuse and to some innovations in the area of treatment. It was at first blush disappointing that the narcotic antagonists had such a poor patient acceptance. In retrospect this should have been anticipated, for the narcotic antagonists do not in any way relieve the hypophoric feelings of patients. This in no way detracts from the validity of the concepts of Wikler concerning the role of conditioning in relapse, for hypophoria and conditioned abstinence and drug-seeking behavior are probably coexisting pathologies. If treatment is to be optimized, in all probability both will have to be dealt with. It is my conviction at this time that extinction of conditioned abstinence and drug-seeking behavior using antagonist therapy will be better accepted by patients whose hypophoria has been decreased. One of the fundamental questions is how we can develop antihypophoric drugs which will not induce tolerance and/or dependence and not exacerbate existing hypophoria. Perhaps in this regard we have attended too much to the early abstinence syndrome and not enough to the pathophysiology of the protracted abstinence syndrome.

There seems little question now that a variety of neurotransmitters and receptors are involved in affective disorders. It thus should be possible to identify agonists which when administered under appropriate circumstances should be able to relieve feelings of hypophoria and thus rectify this pathologic situation.

This may represent a radical departure from current strategies in drug development for it is aimed at developing drugs that will be highly reinforcing to patients suffering from hypophoria but which will neither exacerbate their disease nor be toxic.

Somatosensory Affectional Deprivation (SAD) Theory of Drug and Alcohol Use

James W. Prescott, Ph.D.

The somatosensory affectional deprivation (SAD) theory of drug and alcohol use is a developmental psychobiological theory that is proposed to account for the common ground of the many and diverse theories of substance abuse. The first basic proposition of this theory is that the neurobiology of our behavior is not only inseparable from, but is in fact largely shaped by, culture. The shaping process of culture upon the developing brain (the organ of behavior) is accomplished through our various sensory modalities and through the sensory processes of deprivation and stimulation.

With few exceptions, the developing mammalian brain, particularly the primate brain, is highly immature at birth and is dependent upon sensory stimulation for its normal growth, development, and functional and structural organization. The richness or paucity of dendritic structures of the neurone (brain cell), for example, is largely influenced by the sensory processes of stimulation and deprivation during the formative periods of brain development. The complexities and possibilities of neuronal communication (and thus behavior) are dependent upon the complexity of dendritic structures of brain cells (Greenough 1975; Greenough and Juraska 1979; Rosenzweig 1979; Floeter and Greenough 1979; Riesen 1975; Globus et al. 1973; Coss and Globus 1979; Coleman and Riesen 1968; Horn et al. 1979; Spinelli and Jensen 1979; Blakemore and Cooper 1970; Hirsch and Spinelli 1970; and Hubel and Wiesel 1970). Dendritic structures are analogous to telephone cables that interconnect various telephone centers (brain cells) with one another. These dendritic structures of brain cells form the structural basis of interneuronal communication. Another major element in the story of interneuronal communication is neurochemical transmitter substances which are present at synaptic junctions between dendrites and which make possible the transfer of "information" from one brain cell to another. These events are accompanied by electrophysiological activity, which is another manifestation of interneuronal communication. The point of this synoptic overview of interneuronal communication is to emphasize that the morphological (structural) and the neurochemical and electrophysiological (functional) processes of interneuronal communication are all strongly influenced by the sensory processes of stimulation and deprivation. Thus, the effects of the social, physical, and cultural environment are ultimately transformed into perceptual experiences through the encoding and decoding of sensory processes. Further, whether certain perceptual experiences can ever be realized will be dependent upon the quality and quantity of our sensory experiences, as structured by our social, physical, and cultural environment during the formative periods of brain development (Prescott 1967, 1971a,b, 1972a,b, 1973, 1975, 1976a,b, 1977, 1978, 1979b).

The second basic proposition of SAD theory is that certain sensory modalities and processes are more important than others in accounting for emotional/social disturbances and substance abuse. Specifically, it is the emotional senses of somesthesis (touch), vestibulation (movement), and olfaction (smell), that are the primary mediators of our emotional/affective behaviors. Substance abuse that alters primarily our emotional/affective state must be understood within the context of our emotional senses. It is the deprivation of our emotional senses and not our cognitive (visual-auditory) senses during the formative periods of brain development that can account for and predict our emotional/affective social behaviors, which include not only substance abuse but abusive social behaviors in general. Thus, the question of destructive and exploitive behaviors toward ourselves and others becomes a question of whether affectional bonds are formed or not formed during the formative periods of brain development. Within an evolutionary context, it should be noted that olfaction assumes a greater role in lower mammals, and vestibular functions assume a greater role in higher mammalian forms, specifically the primate, in the formation of affectional bonds (Prescott 1976a, 1977). Similarly, substance abuse that alters primarily our cognitive state (e.g., hallucinogens) must be understood within the context of our cognitive (visual/auditory) senses. It should be noted that movement (vestibulation) is often involved in altered cognitive states and it has been proposed that the vestibular-cerebellar neuraxis may be a master integrating/regulating system of sensory-emotional and motor processes. Thus, the vestibular-cerebellar system may serve as a "bridge" between our "emotional" and "cognitive" senses (Prescott 1976a, 1977; Erway 1975).

In previous studies, the SAD theory has been successful in predicting physical violence (high and low) in 100 percent of 49 primitive cultures distributed throughout the world. This was made possible by evaluating the degree of physical affection (touching, holding, carrying) of the infant by its mother or caretakers and by the degree of physical affection that was permitted to be expressed through the acceptance or rejection of premarital sexuality (Prescott 1975, 1977, 1979b).

The issue of violence, i.e., the failure of nurturance and the failure to form affectional bonds, is strongly related to the issue of substance abuse in several aspects. First, in a very general sense, the body needs and "searches" for a state of harmony, contentment, and in higher life forms (homo sapiens), an altered and transcendent state of conscious "being." A necessary condition for the attainment of this "state of being" is the experiencing of physical (somatosensory) pleasure that is essential for the formation of affectional bonds. When somatosensory pleasure and affectional bonds are denied, then compensatory behaviors to reduce tension, discomfort, and "anomie" become imperative. The common compensatory behaviors are physical violence (toward others and oneself), alcoholism and drug abuse, and perseverative stimulus-seeking behaviors that attempt to provide the sensory stimulation that was deprived early in life. The stereotypical rocking behaviors of isolation-reared Harlow monkeys and of institutionalized children is a case in point. The "quieting" effect of stimulant drugs upon some hyperactive children is another illustration of a "need for neural activation" that is met by pharmacological stimulation rather than by sensory stimulation. The chronic stimulus-seeking behaviors, particularly of a sexual and violent nature, in the American culture (evidenced, for example, by massage parlors, pornography, violent films, rape) are also illustrative of this basic principle of stimulus-seeking behaviors consequent to early somatosensory deprivation (Prescott 1972a, 1973, 1975, 1976a,b). Additional studies that relate early sensory experiences to later behaviors, particularly aberrant sensory behaviors, can be usefully consulted (Ainsworth 1972; Cairns 1966, 1972; Bowlby 1969; Harlow 1971; Harlow et al. 1963; Dokecki 1973; Lichstein and Sackett 1971; Lynch 1970; Mason 1968, 1971; Mason and Kenney 1974; Mason and Berkson 1975; Fuller 1967; Freedman 1968; Friedman et al. 1968; Melzack and Burns 1965; Melzack and Thompson 1956; Melzack and Scott 1957; Mitchell 1968, 1970, 1975; Mitchell and Clark 1968; Sackett 1970; Riesen 1960, 1961a,b, 1965; Schaffer and Emerson 1964a,b; Spitz 1945, 1965; Suomi and Harlow 1972; Zubek 1969).

The self-mutilation and pain agnosia of children characterized by psychosocial dwarfism consequent to somatosensory affectional deprivation and child abuse reported by Money et al. (1972), is a classic verification at the human level of the same behaviors (self-mutilation and pain agnosia) found in animals reared under conditions of somatosensory affectional deprivation (social isolation) (Lichstein and Sackett 1971; Melzack and Burns 1965; Melzack and Scott 1957; and Mitchell 1968, 1970, 1975). The pain agnosia of children subjected to physical restraint and immobilization reported by Friedman et al. (1968) is another demonstration of these relationships at the human level.

Another important dimension to these early experiences and behaviors is the neurochemical and neuroendocrine mediators of pain hypersensitivity and pain hyposensitivity (pain agnosia) consequent to somatosensory deprivation. Harvey and Yunger (1973) have shown that decreases in brain serotonin (5-HT) result in an increased sensitivity to pain, and Coleman (1971) has shown that isolation-reared monkeys who are characterized by both tactile hypersensitivity and hyposensitivity (Lichstein and Sackett 1971) have significantly decreased levels of platelet serotonin.

A number of investigators have also shown that there is significant reduction in growth hormone (GH) and adrenocorticotropin (ACTH) in psychosocial dwarfism (reversible hyposomatotropism) (Patton and Gardner 1975; Powell et al. 1967a,b; Wolff and Money 1973; Money and Wolff 1974; Brown 1976). Significant to these findings is the report that endogenous opioids are involved in the regulation of serum growth hormone (GH) and prolactin (PRL). Specifically, naloxone depresses basal serum concentration of GH and PRL. Related to the above are the well-known phenomena that stress elicits an increase of endogenous opioids in the brain; and of ACTH and β-endorphin in the systemic circulation; and that serotonin increases prolactin, growth hormone, and adrenocorticotropin (Meites et al. 1979).

These observations are made to suggest that psychosocial dwarfism may well be characterized by abnormal endorphin mechanisms which may be responsible for the observed abnormalities of GH and ACTH in psychosocial dwarfism. Thus, these speculations suggest that endorphin mechanisms may assume a much greater role and significance in somatosensory affectional deprivation phenomena than has heretofore been realized.

The findings of Behling (1979) highlight the relationship between alcohol abuse, child abuse, and failure of nurturance, showing that in 69 percent of 51 instances of child abuse, at least one parent had a history of alcohol abuse.

In the context of the SAD theory, it is not surprising to find the compensatory behaviors of violence in the primitive culture study cited above or the finding of Barry (1976) that the single greatest predictor of drunkenness in 13 primitive cultures was the large amount of crying during infancy (r=0.77). Drunkenness was also significantly correlated with low general indulgence during infancy (r=0.40; N=26) and low duration of bodily contact with caretaker during later stages of infancy (r=0.42; N=23). Significant relationships between deprivation of parental physical affection and use of drugs and alcohol have been reported for college students (Prescott 1975), for prisoners (Prescott and Wallace 1978), for institutionalized alcoholics, and for participants in a drug treatment program (Prescott and Wallace 1976). Significant relationships between high drug and alcohol usage with attitudes rejecting premarital and extramarital sex have also been reported for college students (Prescott 1975).

An interpretive statement of these relationships with respect to somatosensory pleasure seeking, isolation rearing (somatosensory affectional deprivation), altered neuronal communication, and altered states of "consciousness" appears necessary. Briefly, the SAD theory postulates that somatosensory deprivation from isolation rearing leads to impaired brain neuronal systems that mediate pleasure which now lack the neuronal structural bases to interact with and influence higher brain (cognitive) centers (neocortex). This impairment prevents an integration of somatosensory pleasure with higher brain centers and precludes the normal development of altered states of consciousness or states of "transcendent being." (See Teilhard de Chardin's 1933 essay "The Evolution of Chastity" on the role of pleasure in achieving states of "transcendent being.") Consequently, most of the somatosensory pleasure-stimulus-seeking behaviors of contemporary Western civilization (not just America) appear to be "nonintegrative" in nature, i.e., primarily "reflexive." This means the "pleasure experience" is a momentary and transitory phenomenon that produces a temporary reduction of physiological tension and discomfort but does not represent a true positive state of "integrative pleasure" that is essential for experiencing an "altered state of consciousness." Thus, anomie remains, a high need for another "pleasure fix" remains, and the complex of perseverative behaviors remains. Drugs and alcohol "bypass" the somatosensory process and provide a direct route to higher brain centers that alter "states of consciousness" which simulate states of "transcendent being." It should be noted that somatosensory affectional deprivation from social isolation results in an aversion to touch and thus constitutes a barrier to the "touch therapy" that is essential for rehabilitation, namely, the establishment of emotional/affective-social relationships.

Within the context of SAD theory, three basic groups of substance abusers are proposed to exist and need to be evaluated and treated differently. These are (a) pleasure seekers (marijuana, heroin, etc.),

(b) pleasure avoiders (alcohol, depressants, tranquilizers), and (c) "altered states of consciousness" seekers (hallucinogens).

A factor-analytic study involving items of drug and alcohol usage produced orthogonal (independent) factors for alcohol and marijuana usage (Prescott and Wallace 1976). Unfortunately, time and space do not permit review of these data or an elaboration of SAD theory of drug typologies and their implications for research and therapy. It is suggested, however, that a sensory process orientation would be highly heuristic. Special attention should be given to evaluating vestibular-cerebellar processes in alcoholics, somesthetic-cerebellar processes in pleasure-seeking drug users, and visual/auditory neocortical processes in hallucinogen users. It should be recognized that these suggestions are highly speculative and have many limitations, but they may, nevertheless, have some merit in attempting to identify specific neurobiological brain processes with specific choices of substance use and abuse.

Evidence that social isolation rearing alters neurochemistry of brain function has been partially reviewed elsewhere (Prescott 1971a, 1976a; Lal et al. 1972; Essman 1971, 1974, 1979; Essman and Casper 1978; Welch and Welch 1969; Valzelli 1967; De Feudis and Marks 1973; Rosenzweig 1979; Rosenzweig et al. 1968). Certain studies, however, deserve special commentary, and recent developments with respect to the endorphins are especially relevant to somatosensory affectional deprivation theory and data, as is the basic alteration of the CNS's response to drugs that is induced by SAD of isolation rearing.

In this specific social-neurobiological context, Lal et al. (1972) have demonstrated that social isolation rearing of mice (somatosensory affectional deprivation) significantly altered the pharmacological effects of hexobarbital, pentobarbital, chloral hydrate, barbital, and chlorpromazine. Specifically, social isolation enhances stimulant drug effects and reduces CNS depressant effects.

Bonnet et al. (1976) reported that mice reared in social isolation (somatosensory affectional deprivation) for 20 weeks showed a significant reduction in narcotic agonist and antagonist binding. No differences could be found in stereospecific binding between the rearing groups with 15 weeks of differential rearing, but were found at 17 and 21 weeks. These authors also reported a significant reduction of the number of opiate binding sites in the brains of isolation-reared mice compared to aggregation-reared mice. This loss of opiate receptor sites in isolation-reared mice may be analogous to the loss of dendrites consequent to social isolation rearing.

Panksepp et al. (1978) and Herman and Panksepp (1978) reported a significant decrease in distress vocalizations of puppies which were briefly separated from their mothers (15 minutes) with an injection of 0.125 mg/kg of oxymorphone, and they found that naloxone increased group vocalization of two- to five-day-old white Leghorn chicks briefly separated from their mother. These authors discuss the parallels between the biological nature of narcotic addiction and the formation of social bonds, and their theoretical position is similar to SAD theory and my belief that the brain endorphin systems may be one of the most important neurobiological systems mediating the development of affectional bonds, including sexual affectional bonds.

The role of endorphins in sexual behavior has been studied by Gesa et al. (1979), and they have reported the following findings from their rat study:

a) DALA (D-Ala^2-Met-enkephalinamide) given intracerebroventricularly at a dose of six micrograms completely inhibited copulatory behavior and the ability to ejaculate in sexually active rats. Naloxone (four mg/kg) given intraperitoneally completely reversed this effect.

b) Naloxone does not enhance sexual behavior in sexually active rats.

c) Naloxone (four mg/kg) given intramuscularly significantly enhances mounting, intromission, and ejaculation in sexually inactive rats.

These authors suggest that endorphins may mediate sexual disorders and that opioid antagonists "might become potentially useful therapeutic agents for sexual disturbances in man" (p. 204). A similar statement might be made for the treatment of alcoholics whose somatosensory pleasure system is dysfunctional and often inoperable. Whether pleasure-inducing drugs, such as marijuana and the opioids, may prove to be a useful first step in a program of somatosensory rehabilitation for alcoholics and other somatosensory impaired individuals remains to be demonstrated. Different therapeutic strategies appear indicated, however, for differing classes of substance abusers.

Veith et al. (1978) have also reported the effects of endorphin compounds upon emotional and sexual behaviors in rats. They examined the consequences of a single intraperitoneal injection of 100 mg of α-endorphin (β-LPH 61-76), γ-endorphin (β-LPH 61-77), and β-endorphin (β-LPH 61-91), and a [D-Ala^2] analog of Met-enkephalin upon several measures of open field behavior compared to saline controls.

In brief, these authors found that β-endorphin enhanced grooming behavior; γ-endorphin and its analog [D-Ala^2] increased emotional responses (ran to the wall faster and greater defecation); and α-endorphin [D-Ala^2] increased sexual arousal (penile erection and seminal discharge). The selective behavior effects of these various peptides were emphasized, and it was suggested that each peptide may be coded to act upon receptor rates in a differential manner to mediate the differing behavioral effects.

From this writer's perspective it is sufficient to emphasize the social, emotional, and pleasure (sexual) behaviors that are induced by endorphin compounds. In this context, it is heuristic to note the findings of Houck et al. (1980) who reported two β-endorphinlike materials in human placenta from three patients undergoing natural childbirth. These authors speculate upon the possible role of placental endorphins "as a natural antidote to the pain and stress of parturition." This writer cannot help but speculate further that the positive emotional state toward pregnancy of women electing natural childbirth may be reflected in a "positive intrauterine state" that is characterized by the presence of placental endorphin. This raises additional questions whether "stressful" pregnancies or "unwanted" pregnancies are characterized by a significant decrease or lack of placental endorphins.

Finally, does the presence or absence of placental endorphins reflect, in any way, the integrity of fetal endorphin mechanisms or the future developmental integrity of neonatal/infant/child endorphin mechanisms? Does obstetric medication have any adverse effect on fetal endorphin mechanisms? Do such events have any long-term developmental implications for how pain and pleasure are experienced, the quality of development of emotional-social relationships, and whether and what coping/compensatory behaviors may be adopted as a consequence of dysfunctional psychobiological affectional mechanisms?

These studies are cited because of the increasing evidence that has linked affectional variables and early social isolation to (a) violence, drug and alcohol abuse, and sexual dysfunctioning; (b) altered neurochemistry, electrophysiology, and dendritic structures (neuronal communication) in somatosensory and motor cortex and cerebellar cortex; (c) altered narcotic agonist and antagonist binding; and (d) altered CNS response to stimulant and depressant drugs. The role of sexual functioning and sexual pleasure in the developmental continuum of affectional bonding and its relationship to endorphins, drug and alcohol use, and violence, particularly alcohol-induced violence, brings a convergence of theories and experimental evidence that were heretofore considered disparate entities and phenomena. The report of Pradelles et al. (1979) that visual deprivation decreases Met-enkephalin in various amygdaloid and striatal structures provides further support for linking sensory deprivation phenomena to enkephalin neurotransmitter or neuroregulatory processes.

The findings of Gesa et al. (1979) and of Panksepp (1978), however, appear contradictory and inconsistent with this proposed convergence. In the former study, stimulation of opiate receptors induced pleasure-deficit behaviors (failure to copulate and ejaculate), whereas in the latter study, stimulation of opiate receptors induced pleasure-enhancement behaviors (decrease in distress vocalizations). Similarly, in the Gesa study naloxone enhanced pleasure behaviors (increased copulation and ejaculation), whereas naloxone decreased pleasure behaviors (enhanced distress vocalization) in the Panksepp study. These apparent fundamental contradictions are, it is proposed, resolvable within SAD theory and Cannon's Law of Denervation Supersensitivity (Cannon 1939; Cannon and Rosenbleuth 1949; Collier 1968; Sharpless 1975), which is an integral and essential neurophysiological mechanism of SAD theory (Prescott 1971a, 1972b).

Briefly, fundamental distinctions must be made between CNSs that are characterized by or not characterized by denervation supersensitivity, which is induced by deafferentation, i.e., a loss of afferent input. Sexual inactivity, like social isolation rearing, involves somatosensory deprivation that constitutes a special case of functional deafferentation. As reported by Struble and Riesen (1978), primate isolation rearing results in loss of dendrites in somatosensory cortex. The loss of opiate receptor sites, reduced narcotic agonist and antagonist binding, enhancement of stimulant drug effects, and inhibition of depressant drug effects are also all consequent to social isolation and thus share, in my view, a common explanatory mechanism, namely, Cannon's Law of Denervation Supersensitivity. It is within this context that it is relevant to emphasize that opioid substances act on their receptors to depress the activity of cells bearing these receptors and, consequently, are classed as inhibitory neurotransmitters (Frederickson and Norris 1976). The enhancement of these inhibitory neurotransmitters through the mechanism of denervation supersensitivity might account for the inhibition of copulatory and ejaculatory behavior as reported by Gesa et al. (1979). Similarly, the absence of denervation supersensitivity in Panksepp's experimental subjects could account for his endorphin stress-reducing (pleasure-enhancing?) effects.

The findings of Gispen et al. (1976) that low doses of β-endorphin (0.01-0.3 micrograms) induced excessive grooming behavior in rats, and of Meyerson and Terenius (1977) that "higher" doses of β-endorphin (one and three micrograms) significantly reduced mounting and copulatory behavior in Wistar rats exposed to estrous females support the "bidirectionality" (prosocial versus asocial behaviors) of endorphin mechanisms. Naltrexone given subcutaneously 30 minutes before the peptide blocked the effect of one microgram β-endorphin, thus confirming that impaired sexual functioning was mediated via opiate receptors. It should be noted that one microgram β-endorphin did not interfere with sexual exploratory behavior that included active pursuit and investigation of the anogenital area of the female.

These reports of bidirectionality of endorphin activity as a function of dosage level, the endorphin antagonistic effects, and the naloxone agonistic effects concerning sexual behaviors are not unrelated to the naloxone agonistic effects concerning pain perception.

Levine et al. (1978), in a study of human clinical pain (tooth extraction), found that naloxone produces analgesia at low doses (0.4 and 2 mg) and hyperalgesia at high doses (7.5-10 mg) for a placebo-respondent group. Interestingly, naloxone had little effect on placebo nonresponders. Questions must be raised whether placebo responders and those experimental preparations that manifest naloxone agonistic effects (bidirectionality) could be characterized by SAD or other forms of induced denervation supersensitivity. These questions are relevant to the findings of Buchsbaum et al. (1977), who divided their subjects into pain-sensitive and pain-insensitive groups as determined by their ratings of an electric shock. They found that only the pain-sensitive subjects reported a naloxone (2 mg) analgesic effect and that pain-insensitive subjects showed naloxone hyperalgesia.

Although the studies of Levine et al. (1978) and Buchsbaum et al. (1977) are not directly comparable since Levine employed multiple doses of naloxone and Buchsbaum employed a single naloxone dose, it is of interest to contrast the two naloxone hyperalgesia groups with respect to the issue of placebo responding. Levine et al. reported a naloxone bidirectional effect for placebo responders, whereas Buchsbaum's pain-insensitive bidirectional responders (naloxone hyperalgesia) were characterized as placebo "nonresponders" since their placebo response was less than half that of the pain-sensitive group. These "inconsistencies" require further experimental study.

These observations only complicate an already very complicated set of issues and phenomena of endorphin-related behaviors. However, the bidirectionality phenomena of naloxone and the naloxone agonist effects and endorphin antagonist effects involving not only pain phenomena but also sexual-social and motor behaviors (Gesa et al. 1979; Meyerson and Terenius 1977; Gispen et al. 1976; Bloom et al. 1976; Jacquet and Marks 1976) suggest an extremely complex role of modulation, regulation, and integration of sensory, social, emotional, and motor behaviors by the endorphin system.

A theory of cerebellar regulation and integration of sensory, social, emotional, and motor behaviors within the context of SAD theory has been previously elaborated (Prescott 1971a, 1976a, 1978). Heath and his coworkers (Heath 1972, 1975a,b, 1976, 1977; Heath et al. 1978, 1979) have established a wealth of data describing cerebellar-limbic relationships, which were postulated by SAD theory. They have further dramatized how cerebellar stimulation can modulate extreme states of emotional expression (positive and negative) in human subjects. According to SAD theory, the cerebellum is not itself the site of these behaviors, but it exerts a regulatory influence on limbic, reticular, and frontal cortical structures to modulate these behaviors. Cerebellar modulation of limbic-endorphin activity would be a natural extension of SAD theory and could be tested in both animal and human studies. It would be expected, for example, that endorphin/naloxone behaviors would be altered with chronic cerebellar electrical stimulation that resulted in profound changes in emotional behavior, as described by Heath et al. In particular, since Heath (1972, 1975a,b) has documented abnormal electrical spike discharges in the limbic and cerebellar structures of isolation-reared primates, and Saltzberg and colleagues (Saltzberg et al. 1971; Saltzberg and Lustick 1975; Saltzberg 1976) have developed signal analysis methods to detect these deep brain spike discharges from scalp EEG recordings, it is now possible to undertake studies that could link a known history of somatosensory affectional deprivation to abnormal deep brain spike activity and to specific patterns of endorphin/naloxone-induced behaviors associated with dysfunctional behaviors, e.g., alcohol-induced violence and impaired sexual functioning. Effective therapies should be reflected in elimination of spike discharges, altered endorphin/naloxone behaviors, development of affectional emotional behaviors, and elimination of drug and alcohol dependence.

The role of the cerebellum in somatosensory affectional deprivation has been given support by Berman et al. (1974); and Floeter and Greenough (1979), who reported significant increases in spiney branchlets of Purkinje cells in the para flocculus and the nodulus of the cerebellum in monkeys reared in colony conditions compared to isolate-reared and socially experienced animals (environmental variation of SAD). The finding of opiate receptors in the cerebellum should be noted in this respect (Meunier and Zajah 1979). Although denervation supersensitivity mechanisms inherent in somatosensory affectional deprivation are offered as a major explanatory process in accounting for the variety of diverse and often apparently inconsistent and contradictory findings from the endorphin/naloxone behavioral literature, it is recognized that other factors, e.g., neonatal anoxia, can induce denervation supersensitivity (Berman and Berman 1975; Burch et al. 1975) and that the "family" of endorphins and their antagonists are additional factors that can contribute to the complexity of findings reported in the literature and their interpretation.

The major theoretical orientation of this paper is to emphasize that any study of endorphin/naloxone behaviors or drug/alcohol behaviors must take into account the developmental history of the organism to determine whether the CNS of that organism is characterized by denervation supersensitivity, whether induced by somatosensory affectional deprivation or other etiological developmental factors.

The phenomenon of "hyperendorphinism" of affective disorders (Buchsbaum et al., in press), which may well be an expression of "neurotransmitter density" due to denervation supersensitivity, is an example of a construct that might be benefited by a developmental perspective. (Neurotransmitter density in neurochemistry is analogous to current density in electrophysiology and expresses the relationship of the amount of released neurotransmitter substance available to the number of available receptors.)

Since isolation rearing results in a reduction of the number of opioid receptors, a state of "hyperendorphinism" may not reflect a change in absolute volume of released endorphin but rather a change in the number of opioid receptors (endorphin density). The converse could also occur (increased volume of endorphin with receptor number remaining constant) for different etiological reasons. This is mentioned for the purpose of suggesting that "hyperendorphinism" may not be a unitary phenomenon since different mechanisms and etiologies could mediate this effect.

It would be a serious omission not to mention the classic theoretical system developed by Petrie (1976), which has unusual relevance to the issues of substance abuse and to somatosensory affectional deprivation theory. Briefly, Petrie has proposed a theoretical system that postulates CNS processes of reduction and augmentation of the sensory environment to describe an individual's "reactance" to pain and sensory deprivation. The "CNS augmenters" are characterized by an intolerance for pain and a tolerance for sensory deprivation. This pattern of reactance occurs because the CNS of these individuals acts to augment or enhance the impact of a sensory event upon the CNS. Conversely, the "CNS reducers" are characterized by a tolerance for pain and an intolerance for sensory deprivation. This pattern of reactance occurs because the CNS of these individuals acts to reduce or inhibit the impact of a given sensory event upon the CNS. Thus, the "CNS reducers" are characterized by a chronic state of insufficient afferent stimulation (stress of sensory insufficiency or sensory deprivation) and engage in behaviors that are designed to maximize afferent stimulation of the CNS. Consequently, these "CNS reducers" are those who engage in a variety of stimulus-seeking behaviors, e.g., when punished with solitary confinement, delinquents who are CNS reducers will frequently engage in self-mutilative behaviors, such as cutting themselves with razors or burning themselves with cigarettes (note self-mutilation of isolation-reared animals).

Petrie (1976) described the response of reducers, moderates, and augmenters to alcohol and found that augmenters were most affected by dramatically changing from an augmenting reactance mode to a reducing reactance mode. Similar but less strong reducing effects were obtained with reducers. Comparable results were obtained with other drugs, such as aspirin and chlorpromazine. Thus, augmenters as a group were shifted away from pain intolerance to pain tolerance. Buchsbaum (1978) has provided a review of a number of neurophysiological studies from his laboratory and others on reducers and augmenters. Without reviewing all of his findings, suffice it to point out that he reported that reduction of the amplitude of sensory-evoked potentials to increased stimulus intensity was associated with pain tolerance and analgesia, and that augmentation was linked to substance abuse. The studies of Buchsbaum and Ludwig (in press) and von Knorring and Oreland (1978) are also relevant to these issues.

It has been previously suggested that somatosensory affectional deprivation of isolation rearing is a major contributing factor in the developmental neuropsychobiological substrate of Petrie's typology of reducers and augmenters (Prescott 1967). Chronic or perseverative stimulus-seeking behaviors and impaired pain perception, for example, are predominant characteristics of somatosensory affectional deprivation (denervation supersensitivity) and the "CNS reducer." There are, however, significant differences in the communality of the two theoretical systems in which SAD is characterized by "paradoxical" behaviors, e.g., simultaneous supersensitivity to touch and impaired pain perception that are not accounted for by Petrie's typology. Zuckerman's (1979) theory of sensation seeking is also intrinsically related to the theories of Petrie (1976) and Prescott (1967, 1971a,b, 1972a,b, 1973, 1975, 1976a,b, 1977).

This writer has attempted to link these basic developmental neurobiological processes of SAD to cross-cultural characteristics of childrearing practices; to social and religious mores and customs that regulate sexual behaviors; and to personality characteristics of authoritarianism, exploitation, and narcissism in contrast to egalitarianism, nurturance, and altruism. Further, it is postulated that these contrasts in personality characteristics, considered at the microsocial level, constitute the bases for the political structure of a culture, namely, egalitarian-democratic societies versus authoritarian-fascist societies (Prescott 1975, 1976, 1977). It is of some significance that Petrie (1976) draws exactly the same parallels from her theory to the characteristics of both personality and culture with her typologies of "compassion" (augmenter) versus "callousness" (reducer) (pp. xii-xiv).

In concluding this theoretical essay it hardly needs to be emphasized that the social-emotional dysfunctioning of the individual in society, in whatever form it may be expressed, is not only an intrinsic aspect of neurobiological functioning of the individual but also of the social-psychological forces of culture that shape the individuality of neurobiological functioning through the formative developmental processes of sensory stimulation and deprivation, and through a culture of chemical and physical environments that influence fetal, neonatal, and postnatal development. Maternal habits of chemical ingestion, e.g., alcohol, drugs, food/spice preferences, or exposure to certain chemical environments during gestation, may well "imprint" upon the developing fetus certain "sensitivities" and "predispositions" for use or avoidance of those chemical agents during postnatal life with all the implications that this has for behavior.

It necessarily follows that preventive and therapeutic programs cannot be restricted to molecular biological strategies that are directed at the individual organism. The reconstruction of the individual requires also the reconstruction of society and culture.

The elements of societal and cultural reconstruction involve not only shaping a safe, beneficent physical environment but also a nurturant, caring, and affectionate environment of human relationships. The latter touches deeply upon philosophical and religious ideologies that regulate the morality of pain and pleasure in human relationships and the role of women in society.

The matrilineal/patrilineal structure of human cultures and their relationship to nurturance in human relationships, as well as the construction of the supernatural in human cultures, are a logical extension of SAD theory. However, it is beyond the scope of this essay to develop these topics and relate them to what has been reviewed herein.

A Theory of Alcohol and Drug Abuse

A Genetic Approach

Marc A. Schuckit, M.D.

A GENERAL OVERVIEW

Genetically influenced biological factors explain only one part of the variance in the development of alcoholism and drug abuse. Even for those persons genetically predisposed, the final clinical picture involves a combination of genetic factors (leading both toward and away from substance abuse) and environmental events (with similar positive and negative aspects).

Before proceeding with the theory on the importance of genetics in substance abuse, it is necessary to present briefly some of the data supporting the conclusion that genetics plays any role at all. The picture is not irrefutable, as it is difficult to carry out human studies while controlling enough factors to make definite conclusions. The most important aspect of this research is the manner in which the different methods carried out in different settings generate such consistent data (Robins 1978).

DATA SUPPORTING GENETICS IN ALCOHOLISM AND OTHER DRUG ABUSE

The most impressive amount of information is available on alcohol, with much less data on other substances. Thus, the two topics will be discussed separately.

The first indication of a possible genetic influence comes from the studies of families of alcoholics, where it has been repeatedly shown that the chances of a child developing alcoholism as an adult increase with the number of alcoholic relatives, the severity of the alcohol problems in those relatives, and the degree of genetic closeness to the ill relative (Schuckit et al. 1972; Goodwin 1976). The hypothesis is further strengthened by genetic marker studies demonstrating a possible link between the number of factors known to be genetically influenced

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(e.g., blood type) and alcoholism within certain populations or families, although these results are difficult to replicate. Data from animal studies are consistent with the theory of the importance of genetics in that they show that it is possible to breed strains of animals with relatively higher and lower tendencies toward drinking alcohol, a factor which may shed light on the onset of drinking but not necessarily on alcoholism itself.

The most persuasive alcoholism-related genetic information in humans comes from twin studies and adoption investigations. In twin research the level of similarity for alcoholism (i.e., concordance) in fraternal twins, who share only 50 percent of their genes, is compared to the level of concordance in identical twins, who share 100 percent of their genes. These studies have shown a level of heritability for drinking and drinking problems (Partanen et al. 1966), as well as a higher concordance rate for alcoholism in identical twins (around 60 percent) than in fraternal twins (around 30 percent) (Kaij 1960). The adoption studies, comparing the outcome for alcoholism in children of alcoholics separated from their parents near birth to that of a suitable control population, have used diverse methodologies ranging from half-siblings to actual adoption records in three different countries and yet have shown similar results (Schuckit et al. 1972; Goodwin 1976; Bohman 1977). The children of alcoholics demonstrate elevated risks for alcoholism even if separated from their parents near birth and raised without knowledge of their biological parents, while the children of nonalcoholics do not have elevated risks for alcoholism even if reared by alcoholic adoptive parents (Schuckit et al. 1972; Goodwin et al. 1974).

The data supporting the importance of genetic factors for abuse of drugs other than alcohol are much less complete. There are some limited family data showing a correlation between drug use in groups of young men and drug use and problem patterns in their parents (Tennant 1976; Smart and Fejer 1972; Annis 1974). There is also information demonstrating the possibility of breeding high and low morphine-preferring strains of rats and mice (Nichols and Hsiao 1967; Eriksson and Kiianmaa 1971). Unfortunately, there are no well-controlled studies of twins or investigations utilizing the separation model for studying drug abuse.

A number of investigations have looked for possible ties between genetic factors which might underlie drug abuse and those which might be responsible for alcoholism. The results are tentative, demonstrating, for instance, that alcohol and drug problems may run in the same families (Tennant 1976), but such studies rarely define what is meant by alcoholism or drug abuse and almost never control for related diagnoses such as the antisocial personality (Schuckit 1973). This latter diagnosis might be responsible for the demonstration of secondary alcohol and drug problems within the same family group. Animal studies do demonstrate some degree of crossover between alcohol- and morphine-seeking behavior in strains of animals (Eriksson and Kiianmaa 1971; Sinclair et al. 1973; Nichols 1972). In another approach, a number of theorists have attempted to establish a tie between alcohol and drug abuse and a vulnerability to stress factors such as overcrowding, but the data are inconclusive (Bihari 1976; Westermeyer 1971; Jonas and Jonas 1977). Finally, we must consider the possibility that abuse of one drug (e.g., alcohol) might induce biochemical changes similar to those noted with other drugs (e.g., opiates) (Davis and Walsh 1970; Doust 1974). However, in the absence of more conclusive data, I feel that while alcoholism may be a genetically influenced disorder involving a number of genes, and while it is possible that one or several of those genes might also influence abuse of other drugs, there are not sufficient data to indicate that the same constellation of genetic and/or biological factors underlie the abuse of alcohol and other substances.

In summary, there is good evidence from divergent methodologies in different countries which points to the probable importance of genetics as a contributory factor in alcoholism. Similar data on other drugs of abuse are not available, and the existing information is preliminary and open to interpretation either as being consistent with an environmental or social model, or as indicating an influence of genetics.

POSSIBLE GENETIC MECHANISMS

For a genetic model to have credence, the population being studied must be carefully defined so that one does not confuse transient alcohol-related difficulties, which may be seen in the majority of people age 18 to 25 (Cahalan 1970), with persistent alcohol- and drug-related difficulties--i.e., alcoholism or drug abuse (Schuckit 1973). It is essential that those persons with major preexisting psychiatric disorders in which alcohol or drug abuse might be symptomatic (secondary alcoholics or drug abusers) be excluded from the generalizations about the genetics of alcoholism or drug abuse, as they may be carrying genetic loading for other problems. It is also important to note at this juncture that even with carefully defined alcoholism or drug abuse there will probably be intense and unusual environmental situations which can copy the clinical picture. In this case a good example might be the drug use and abuse patterns noted in soldiers sent to Vietnam, who might otherwise never have used drugs and who, according to some fine followup studies, cease their drug misuse once they return to their home communities (Robins et al. 1975).

With these caveats in mind, in the genetic hypothesis an individual would enter life with a certain level of a genetically influenced biological predisposition toward alcoholism or drug abuse. It is probable that multiple genes are involved or that other factors affect the strength of the actions of a particular gene (i.e., incomplete penetrance of the gene). If the disorder is polygenic (i.e., involving more than one gene) there is probably a combination of genes which might predispose an individual to alcoholism (e.g., the possibility of getting a different level of intoxication when drinking or an unusual effect of alcohol on anxiety, etc.) and some which might help to protect a person from demonstrating alcoholism (e.g., becoming very ill at even low alcohol doses). The person, then, could go through a variety of life events and stresses, some of which would predispose him or her to alcoholism (e.g., working in a heavy-drinking environment, such as the armed services) and others which would protect the person from demonstrating the predisposition (e.g., being a woman in a society with heavy proscriptions against drinking for women). The final alcoholic picture would depend upon the balance between the positive and negative genetic effects interacting with the positive and negative environmental factors.

In this model, a genetic predisposition toward alcoholism might have nothing to do with why people begin drinking in a heavy-drinking society such as ours. Genetic factors might make a modest contribution to the development of relatively minor and evanescent alcohol-related problems, such as those seen in late adolescence and early adulthood. The greatest impact might be on factors which determine why some individuals continue to increase their alcohol intake during their third decade while others gradually but significantly decrease their drinking and, thus, decrease the risk of associated problems.

It is probable that no one genetic factor explains the entire predisposition toward alcoholism. There may be a variety of things involved, including those which might affect the metabolism of alcohol, differences in reactions to acute doses of alcohol, differential responses to more subacute exposure to the drug, differential vulnerabilities to adverse consequences from continued use, different personality types, etc. (Omenn 1975). At the present time, there are some preliminary data to support the theory that the offspring of alcoholics metabolize alcohol differently, showing higher levels of the toxic substance acetaldehyde. At the same time they show a decreased sensitivity of the nervous system to the acute effects of alcohol (perhaps equivalent to innate tolerance) (Schuckit and Rayses 1979; Schuckit 1979c).

The degree of "genetic loading" could combine with the intensity of environmental events to determine the characteristics of the drug-related problems as well. For example, the level of genetic factors could determine which alcoholics begin to have problems in the third decade (heavier genetic load) and which do not demonstrate difficulties until reaching the mid-fifties. Biological factors might also be involved in spontaneous remission from alcoholism through alterations in either the reaction to or metabolism of alcohol which may parallel aging and which might negate the original biological factors responsible for the predisposition. Environmental events could have a large impact in determining age of onset and may help to explain some of the "spontaneous remission" seen with all drugs of abuse, as the decision to continue misuse of the substance may represent a cost/benefit ratio, with the chances of continued abuse decreasing with increasing costs of life problems.

In summary, I feel that alcoholism is probably a multifactorial, polygenically influenced disorder. The relative balance between the degree of genetic loading toward alcoholism and the detrimental as well as protective environmental influences could determine the age of onset of alcohol abuse and the characteristic course for primary alcoholics. Comparable data are not available on drug misuse, but for heuristic purposes, I would picture a similar situation. At the present time, data are not strong enough to support a theory wherein the same genetic mechanisms would be responsible for a general propensity toward all types of drugs, and thus I favor a theory in which the biological mechanisms for alcoholism are different from those for other substances of abuse.

SPECIAL PROBLEMS

A short methodological note is needed. To optimize the chances of discovering any relevant genetic factor, it is important that the group of alcoholics studied be as homogeneous as possible. This requires using a definition stated in relatively objective terms (so that similar studies can be done in different settings) which has been applied to other populations which were followed up over time and shown to run a relatively homogeneous course (Schuckit 1973; Haglund and Schuckit 1977; Woodruff et al. 1974). While there is a great deal of crossover in the populations outlined by definitions utilizing physical dependence, psychological dependence (which is quite difficult to define), a quantity-frequency approach to alcoholism, and the life-problem definition, most of the studies on the genetics of alcoholism have utilized the life-problem definition. Simply stated, persons would be considered alcoholics who demonstrate any one of a number of end-stage life problems related to alcohol (e.g., a marital separation or divorce because of alcohol or physical evidence that alcohol has harmed health or a job loss or layoff related to alcohol or multiple arrests related to drinking) (Schuckit 1979b).

Of course, alcohol or other drug problems can be primary or can develop in the midst of another (possibly genetically influenced) psychiatric disorder (i.e., secondary). It would not make much sense, however, to include in studies of the genetics of alcoholism people who fulfill the research criteria for schizophrenia and who then go on to develop alcohol or other drug problems. It would be equally self-defeating to include in such studies those individuals with unipolar affective disorder, manic depressive disease, or the antisocial personality (Schuckit 1973; Woodruff et al. 1974; Schuckit 1979b). While secondary alcoholics (i.e., individuals demonstrating alcoholism only after the onset of another major psychiatric problem) might be genetically predisposed toward both alcoholism and the primary disease, this would be very difficult to pick up by our present methods.

SPECIAL GROUPS

The pattern of use and abuse of a substance within any population subgroup is, of course, the result of a combination of social, psychological, and biological factors. In this section, I will discuss a number of possible genetically influenced biological factors and environmental events. These will be applied to a variety of subgroups including Native Americans, other ethnic groups including the Irish and Jews, the elderly, women, and youth, and substance-related difficulties in health-care deliverers such as physicians.

Native American groups have exceptionally high rates of alcoholism. This might result in part from high levels of any of the proposed genetically influenced biological mechanisms, although data to date on differences between Native Americans and Caucasians in the metabolism of alcohol have been inconclusive (Bennion and Li 1976). Because members of this group tend to marry other members, any genetically influenced factor raising the propensity toward alcoholism would be likely to be perpetuated. No matter what the level of biological predisposition, the high rate of alcoholism is probably also a response to the heavy-drinking lifestyle on the reservation, the extreme level of social stress that comes from the disintegration of the Native American culture, historical differences in the meanings of alcohol use and intoxication between Native American cultures and Caucasian groups, etc. The final prevalence of alcoholism in this group probably reflects an increased level of genetic predisposition within Native Americans and an environment which maximizes the chance that any such predisposition would become manifest.

The purported high rates of alcoholism in Ireland and among Americans of Irish descent (persisting even when one controls for the level of available income after bare necessities are met) compared with the low rate of alcoholism in Jews in both the United States and Israel is also of interest (Haglund and Schuckit 1977). As is true for Native Americans, individuals in these groups tend to marry other people within the same subgroup, thus perpetuating any genetic propensity that exists, no matter which of the hypothesized mechanisms might be involved. At the same time, environmental factors might alter the expression of any biological propensities. Thus any genetic predisposition toward alcoholism existing in Jews might be dampened by the heavy proscriptions against intoxication and the emphasis on learning how to drink in moderation seen within closely knit Jewish families. Even low to modest rates of biological predisposition in the Irish might be clinically expressed through such factors as the tendency toward late marriage, the ethic of needing to "learn to drink like a man," the social life centering on the pub, etc. (Schuckit and Haglund 1977).

Three other subgroups present interesting questions regarding a genetic hypothesis in alcoholism. The actively drinking elderly alcoholic is likely to have begun alcohol abuse in his or her forties or fifties, after many years of "normal" drinking (Schuckit 1977). This is probably the result of a combination of a lowered level of genetic propensity and earlier life experiences of drinking in a relatively structured environment. The problem may be more likely to become manifest when protective factors disappear as one's children grow up and leave the home, romance leaves the marriage, one recognizes the probability of no further advancements at work, approaching retirement, etc.

The lowered risk for alcoholism in women (Haglund and Schuckit 1977) might reflect some modest differences in metabolism of alcohol or acute reactions to alcohol at various phases of the menstrual cycle (Greenblatt and Schuckit 1976). The alcoholism rate is also consistent with a strong differential effect of environment on men and women, perhaps reflecting the (historically) heavier proscriptions against heavy alcohol intake for women (Cloninger et al. 1978).

The purported increase in alcohol problems in youths is mentioned here only in passing, as a reliable definition for primary alcoholism in adolescents has not yet been developed. Most young people demonstrating alcohol-related difficulties have been shown either to have a primary antisocial personality or to demonstrate polydrug misuse and rarely fit even tentative criteria for primary alcoholism (Greenblatt and Schuckit 1976).

While not many data are available, similar generalizations can probably be made for other drugs of abuse. One notable example is the reported high rate of substance abuse in physicians and nurses when compared to other individuals of the same socioeconomic class (Jones 1977). In this instance, the increased level of problems might not reflect a heightened genetic loading but rather an increased chance that any biological propensity will be expressed. This would reflect the ready availability of drugs and the long hours and life stresses inherent in the health-care professions. However, it is possible that there is some connection between the type of individual likely to go into the health-care professions and an altered acute reaction to drugs, metabolism of drugs, or personality traits predisposing one toward drug misuse.

Opiate Receptors and Their Implications for Drug Addiction

Eric J. Simon, Ph.D.

The implication of the opiate receptor in human disease has not been fully established (Simon and Hiller 1978; Terenius 1978), but it promises to hold exciting implications for the future. The hypothesis held by some investigators for several decades and discussed here is that narcotic analgesics bind to highly specific sites or receptors in the central nervous system to produce their many well-known responses.

Why the human and animal brain should contain sites that can bind with high specificity and affinity substances derived from plants was an important question that led to the discovery of the endogenous opioid peptides. The evidence for receptor sites is compelling, and consists primarily of the remarkable stereospecific action displayed by the narcotic analgesic drugs. This stereospecific characteristic refers to the structural specificity opiate molecules exhibit in interacting with particular substances in the central nervous system.

THE DISCOVERY OF OPIATE RECEPTORS

The search for opiate receptors began in the 1950s and bore fruit in the early 1970s. It was easy to show binding of opiates to cell constituents (Simon and van Praag 1966) but to distinguish specific from nonspecific binding proved difficult.

It was the measurement of stereospecific binding that led to success. Ingoglia and Dole (1970) were the first to apply stereospecificity to the search for receptors. Goldstein et al. (1971) devised a method for measuring stereospecific binding in mouse brain tissue. In 1973, the laboratories of Simon (Simon et al. 1973), Snyder (Pert and Snyder 1973), and Terenius (1973), using modifications of the Goldstein procedure, independently and simultaneously reported the observation in animal brains of stereospecific binding of opiates. Since that time stereospecific binding studies have been done in many laboratories and much evidence has been accumulated suggesting that these stereospecific sites are indeed receptors which are responsible for many of the pharmacological actions of the opiates. They have been found in humans (Hiller et al. 1973) and in all vertebrates so far studied, but they have not been found in invertebrates (Pert et al. 1974).

PROPERTIES AND DISTRIBUTION OF OPIATE RECEPTORS

The properties of the opiate binding sites have been studied extensively and their distribution in the brain and spinal cord has been mapped in considerable detail by dissection and in vitro binding measurements (Hiller et al. 1973; Kuhar et al. 1973) as well as by autoradiography (Pert et al. 1975; Atweh and Kuhar 1977a,b,c).

The results of extensive mapping studies can be summarized here only briefly. The highest levels of opiate receptors are found in areas of the limbic system and in the regions that have been implicated in the pathways involved in pain perception. It has been suggested that the limbic system receptors may be involved in opiate-induced euphoria (or dysphoria) and in the affective aspects of pain perception.

Recently, there has been considerable interest in the question of whether multiple types of opiate receptors exist. Using classical pharmacological approaches Martin and collaborators (Martin et al. 1976; Gilbert and Martin 1976) have suggested the existence of three types of receptors, named μ (for morphine), κ (for ketocyclazocine), and σ for SKF 10,047. Results from Kosterlitz' laboratory also provide evidence for the heterogeneity of opiate receptors (Lord et al. 1977). Thus, the receptors present in the guinea pig ileum seem to have properties distinct from those in the mouse vas deferens. These authors have also reported evidence which suggests that the brain may possess at least two families of receptors differing in their affinity for enkephalins and for exogenous opiates.

DISCOVERY OF ENDOGENOUS OPIOID PEPTIDES

The evidence that the brains of all vertebrates investigated from the hag fish to man contain opiate receptors led investigators to raise the question why such receptors exist in the central nervous system and have survived eons of evolution. A physiological role for opiate receptors that conferred a selective advantage on the organisms seemed probable. None of the known neurotransmitters or neurohormones was found to exhibit high affinity for opiate receptors, which encouraged a number of laboratories to search for new opiatelike substances in extracts of animal brain. This search was successful first in the laboratories of Hughes and Kosterlitz (Hughes 1975) and of Terenius and Wahlstrom (1974). Goldstein and his collaborators (Teschemacher et al. 1975), at about the same time, reported opioid activity in extracts of pituitary glands.

These studies culminated in the identification of the opioid substances in extracts of pig brain by Hughes et al. (1975). They reported that the activity resided in two pentapeptides which they named methionine (Met) and leucine (Leu) enkephalin. This was confirmed by Pasternak et al. (1975) who found the same peptides in extracts of bovine brain. The report of Hughes et al. along with that of the Goldstein group of the existence of opioid activity in the pituitary gland led Guillemin to examine the extracts of pig hypothalami and pituitary glands. Two polypeptides with opioid activity were found and sequenced (Ling et al. 1976). The proliferation of endogenous peptides with opioid activity caused the author of this paper to suggest the generic term "endorphin" (for endogenous morphinelike substance), which has been widely accepted. The C-terminal fragment was renamed β-endorphin by Li (1964), while LPH 61-76 and 61-77 were named α-and γ-endorphin, respectively, by Guillemin (Rossier et al. 1977). In this paper I use endorphin as the generic term for endogenous opioid peptides of which the enkephalins are a subgroup.[1]

Endorphins look (structurally) and behave like opiates, binding to the same brain receptors. All the endorphins, including the enkephalins, exhibit opiatelike activity when injected intraventricularly. This activity includes analgesia, respiratory depression, and a variety of behavioral changes including the production of a rigid catatonia. The pharmacological effects of the enkephalins are very fleeting. The longer chain endorphins are more stable and produce long-lived effects. Thus, analgesia due to β-endorphin (the most potent of all the endorphins so far found) can last three to four hours.[2] All of the responses to endorphins are readily reversed by opiate antagonists, such as naloxone.

Studies on the distribution of β-endorphin in the laboratories of Guillemin (Rossier et al. 1977) and Watson (Watson et al. 1977) have provided convincing evidence for a distribution that is very different from that of the enkephalins. This has led to the suggestion that the central nervous system has separate enkephalinergic and endorphinergic neuronal systems. β-endorphin is present in the pituitary, where there is little or no enkephalin, as well as in certain regions of the brain. Brain β-endorphin seems to originate in a single set of neurons located in the hypothalamus, with axons projecting throughout the brain stem.

PAIN AND ITS MODULATION

Since it was work on the opiate analgesics that led to the discovery of the endorphins and their receptors, it was natural to postulate that they might be involved in pain modulation. The fact that all central nervous system regions implicated in the conduction of pain impulses have high levels of opiate receptors supports this hypothesis. These findings do not prove that endogenous opioids are involved in the pain pathway, but are sufficiently suggestive to encourage further testing of this hypothesis.

Attempts were made to demonstrate the role of the natural opioid system in pain perception by the use of the opiate antagonist naloxone. It was postulated that, if receptor occupancy by endorphins was involved in pain modulation, the administration of an opiate antagonist should lower the threshold or exacerbate perceived pain. Such an effect has been surprisingly difficult to demonstrate conclusively, but at least partial evidence has been developed by several researchers, especially in the case of nondrug-induced analgesia such as that resulting from electrical stimulation, acupuncture, and placebo effect (Jacob et al. 1974; Frederickson et al. 1977; El-Sobky et al. 1976; Grevert and Goldstein 1978; Akil et al. 1976; Hosobuchi et al. 1977; Pomeranz and Chiu 1976; Mayer et al. 1977; Peets and Pomeranz 1978; Levine et al. 1978; Goldstein and Hilgard 1975).

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[1] A consensus, however, has not been reached. A number of prominent investigators preferred to call only the longer peptides endorphins, and the shorter ones (viz., 5 amino acid residue) enkephalins, while using the term "opioid peptide" in the generic sense.

[2] A newly described pituitary peptide, dynorphin (Goldstein et al. 1979), is claimed to be even more potent than β-endorphin.

Their results, though indirect, are supportive of the idea that the endorphin system may be involved in an endogenous pain modulation system. Such a system is likely to be of great survival value to the organism since it will permit it to experience pain as an important warning of tissue damage without the suffering of unbearable, disabling pain, except in pathological states. The importance of pain to the individual is best demonstrated by a disease called congenital insensitivity to pain. Individuals with this condition are unable to feel pain from either visceral or superficial tissue damage. This is a serious pathology which results in a significantly shortened life expectancy. A number of laboratories including our own are currently studying such patients to determine whether an abnormality in the opiate receptor-endorphin system may play a role in this inborn error. Preliminary reports have appeared that naloxone causes pain-associated reflexes and electrical discharges in such patients.

NARCOTIC ADDICTION

Another expected action of the endogenous opioid system is its participation in the development of narcotic addiction. The evidence for this turns out to be more difficult to obtain than that for pain modulation.

All opioid peptides will produce tolerance and physical dependence when injected repeatedly. This does not prove that tolerance/dependence develops to endogenously produced and released endorphins nor that these peptides and their receptors are involved in the formation of tolerance and dependence to narcotics.

A report by Simantov and Snyder (1976), for example, that enkephalin levels are elevated in brains of tolerant rats was recently refuted by experiments from the same laboratory (Childers et al. 1977). The earlier work which had been done using a radioreceptor assay was not supported when the much more specific radioimmunoassay was used.

Recently, however, there was a report (Su et al. 1978) that the intravenous administration of four milligrams of human β-endorphin to human addicts led to dramatic improvement in severe abstinence syndromes. There was no euphoria and little adverse effect. In a double-blind study it was found that subjects were able to distinguish morphine and β-endorphin. After endorphin treatment they felt thirsty, dizzy, sleepy, warm, and had "a strange feeling throughout the body." All these symptoms disappeared in 20 minutes, but the beneficial effects of endorphin on the withdrawal syndrome lasted for several days. The long-lasting suppression of especially the most severe symptoms of abstinence (vomiting, diarrhea, tremor, and restlessness) by a single dose of β-endorphin suggested to the authors the possibility that this endogenous peptide may indeed have a role in the mechanism of tolerance/dependence development to opiates.

Thus, a role of the opiate receptor-endorphin system, while expected and fervently hoped for, has not yet been established. The evidence cited is sufficiently suggestive to warrant further research in this area.

For completeness, I should like to mention two recent developments of considerable interest for which the relationship to the opiate receptor is still unknown.

Walter et al. (1978) reported that it was possible to suppress the abstinence syndrome when rats were withdrawn from chronic morphine by administration of the dipeptide Z-Pro-D-Leu. There was no effect on the analgesic response to morphine. The mechanism of this phenomenon is not understood.

Based on the abundant literature which seems to implicate catecholamines in the actions of opiates, Gold et al. (1978) treated human heroin addicts with clonidine. In a double-blind, placebo-controlled study, clonidine eliminated objective signs and subjective symptoms of opiate withdrawal for four to six hours in all addicts. In an open pilot study, the same patients did well while taking clonidine for one week. All of the patients had been addicted to opiates for six to ten years and had been on methadone for six to 60 months at the time of the study.

CONCLUSION

The discovery of opiate receptors and their supposed endogenous ligands, the endorphins, has kindled the excitement and imagination of many scientists and, through ample coverage in the news media, of the general public as well. Hopes have been raised that these findings may contribute to the solution of a number of human pathologies ranging from intractable pain to mental disease.

There is not yet clear-cut evidence for the involvement of the opiate receptor in any human disease, but the evidence is sufficiently suggestive to encourage much further research in many competent laboratories and hospitals.

There is an interesting difference between this area of research and those involving receptors for other hormones and neurotransmitters. In the other cases the endogenous ligand was discovered and known for some time before a receptor was postulated, searched for, and identified. The opiate field began with the identification of a drug receptor. The proof that such a receptor existed led to the search for endogenous ligands for the receptors and to the identification of a number of peptides with opioid activity. This approach is now being applied to other drug receptors, where it is felt unlikely that their existence anticipated the relatively recent development of the drug. A case in point is the discovery of specific binding sites for the tranquilizer benzodiazepine. Many laboratories are presently engaged in a search for the endogenous ligand for this receptor. Does the body produce its own tranquilizing substance? Is it one of the substances we are already familiar with or is it a substance yet to be identified?

This approach might conceivably be generalizable to other receptors for exogenous substances, such as drugs, viruses, and toxins. In those cases in which a selective advantage to the organism is not evident, a search for an endogenous ligand and a physiological role for the receptor might prove worthwhile.

It should be remembered that the opiate receptor field is only seven years old and fundamental information regarding the physiological role of the endorphins and of the receptor is still missing. A real understanding of the role of this receptor-ligand system in human disease may have to await the elucidation of its functions in normal animals and humans.

PART 2

THEORY COMPONENTS

CONTENTS—*Part 2*

Theorists	Abbreviated titles	Initiation	Continuation	Transition: use to abuse	Cessation	Relapse
Ausubel	Personality-Deficiency Theory	313	336	357	378	--
Bejerot	Addiction-to-Pleasure Theory	313	337	358	378	402
Chein	Disruptive Environment Theory	314	337	358	380	--
Coleman	Incomplete Mourning Theory	315	337	358	381	402
Dole and Nyswander	Metabolic Deficiency Perspective	--	--	--	--	402
Frederick	Learned Behavior Theory	316	338	359	382	403
Gold	Cognitive Control Theory	316	338	360	382	404
Goodwin	Bad-Habit Theory	317	339	--	383	404
Gorsuch	Multiple Models Theory	317	339	360	383	--
Greaves	Existential Theory	318	340	361	385	404
Hendin	Adaptational Theory	318	340	362	385	405
Hill	Social Deviance Theory	319	--	363	--	--
Hochhauser	Biological Rhythm Theory	320	341	363	386	405
Huba, Wingard, and Bentler	Interactive Framework	320	341	--	387	405
Johnson	Drug Subcultures Theory	321	342	363	387	406
Kandel	Developmental Stages Theory	322	343	--	--	--
Kaplan	Self-Derogation Theory	322	345	--	388	407
Khantzian	Ego/Self Theory	323	345	364	388	407
Lindesmith	General Addiction Theory	324	346	365	389	407
Loney	Hyperactive Adolescents Theory	325	347	365	389	--
McAuliffe and Gordon	Combination-of-Effects Theory	325	347	366	390	408
Milkman and Frosch	Coping Theory	326	349	367	393	412
Misra	Achievement-Anxiety Theory	327	--	368	393	413
Peele	Addictive Experiences Theory	327	350	368	394	413
Prescott	Social Neurobiological Theory	327	350	369	395	413
Robins	Natural History Perspective	328	--	370	395	--

CONTENTS—Part 2—Continued

Theorists	Abbreviated titles	Initiation	Continuation	Transition: use to abuse	Cessation	Relapse
Schuckit	Genetic Theory	328	351	371	395	414
Smart	Availability and Proneness Theory	330	352	373	397	414
Smith	Perceived Effects Theory	330	352	373	397	415
Spotts and Shontz	Life-Theme Theory	331	353	374	398	416
Stanton	Family Theory	331	353	375	399	416
Steffenhagen	Self-Esteem Theory	332	354	376	399	417
van Dijk	Cyclical Process Theory	333	355	--	--	--
Wikler	Conditioning Theory	333	355	--	400	417
Winick	Role Theory	334	--	376	400	419
Wurmser	Defense-Structure Theory	334	356	376	401	419

Initiation

PERSONALITY-DEFICIENCY THEORY *(p. 4)*

Ausubel

Drug abuse is generally initiated as a result of an individual's social involvement with drug-using age-mates: The adolescent who is motivationally immature, in addition to commonly having ready access to drugs and living in a sociocultural milieu attitudinally tolerant of drug use, in contrast to his or her nonaddicted, motivationally mature fellows, experiences the tremendous adjustive value of the drug once overcoming its initial unpleasant consequences or side effects, such as nausea or vomiting. After about 10 to 14 days of multiple daily usage she or he becomes physiologically addicted and develops abstinence or withdrawal symptoms 6 to 12 hours after involuntary discontinuation of the drug.

ADDICTION-TO-PLEASURE THEORY *(p. 240)*

Bejerot

Initiation into the use of addicting drugs may occur along at least four main routes (Bejerot 1975), which also have some byways.

The Therapeutic Route

Opiate dependence has been a dreaded complication of medical treatment for centuries. From the time that physicians learned to handle opiates, however, opiate dependence of a therapeutic type has become rare (apart from cancer cases and patients in terminal treatment).

Nowadays there are many persons in industrial countries who have become strongly dependent upon sedatives and hypnotics during medical treatment. This group has a large number of characteristics which have been well defined by Brill (1968) and Allgulander (1978), among others. The patients usually feel ashamed of and guilty about their drug dependence and try to hide it from even their nearest relatives. The tendency to spread this form of addiction to others is therefore very small, almost nonexistent. The frequency of these therapeutic accidents seems to be intimately related to the density of physicians in society.

The Professional Route

Medical staff, and particularly physicians, run a considerable risk of addiction. Pescor (1942) has estimated the risk in different countries to be between 20 and 100 times that of the normal population. Pharmacists and veterinary surgeons are said to have a far lower rate than physicians and nurses, indicating that intimate familiarity with the effects of the drugs on humans, coupled with the ready availability of the drugs, seems to be necessary.

The Epidemic Route

In epidemics of drug abuse, the intoxicant is not socially accepted. Initiation occurs almost without exception, from established abusers to novices, in a densely branched network (Bejerot 1965; Alarcon 1969). The spread occurs in intimate relationships between friends, sexual partners, etc. (Brown et al. 1976), and it is strongly connected to the first year of abuse, "the honeymoon of drug addiction."

The Cultural Route

In the cultural or endemic addictions, the intoxicant is socially accepted (alcohol in the Christian part of the world, cannabis in some Muslim areas, coca among some South American Indian tribes, etc.).

The frequency of addiction of a cultural type varies greatly in different societies. Lewin (1924) states that the whole adult population in the tribes descended from the Incas are cocainists. The other extreme is found in Jewish cultural circles, in which for thousands of years no cases of alcoholism were known, in spite of the fact that Jews, in contrast to Muslims, are allowed to drink alcohol, and although the Jews are among the most persecuted people in the history of the world. Only as a result of secularization during the last several generations have cases of alcoholism begun to appear in this population.

DISRUPTIVE ENVIRONMENT THEORY *(p. 76)*

Chein

A person can take his first shot of a drug at almost any age, and for a wide range of reasons, but in our studies of juvenile males we found that the majority did not begin their experimentation with drugs until they were in their late teens, frequently not until they had stopped attending school. However, 16 seemed to be the most common age. We found that juvenile users who become addicts showed evidence of deep personality disturbances prior to the onset of drug use, and that the vast majority of them live in the most deprived slum areas of the city. While not all juvenile addicts have been delinquent prior to their addiction, they share with other kinds of delinquents a special orientation to life, one which consists of general pessimism, unhappiness, and a sense of futility on the one hand, and mistrust, negativism, and defiance on the other. These attitudes stem from a family life in which the parents are of low socioeconomic status and have little hope of a better future for either themselves or their children; in which there is a lack of love and support for the children and no clear standards of behavior, with inconsistent application of rewards and punishments, and in which there is usually no male to whom the boy can relate in a warm and sustained fashion. Moreover, the parents are usually distrustful of representatives of society such as teachers or social workers.

The consequence of the conditions just outlined is that the boy grows up with no sense of identity, no belief in his own abilities, and no faith in the future. When he is faced with the responsibilities of approaching adulthood he finds himself unable to cope and, surrounded as he is by others who use drugs, he begins to experiment with them himself.

INCOMPLETE MOURNING THEORY *(p. 83)*

Coleman

The misuse of drugs is viewed as a structural or functional imbalance in the family; it is not a problem experienced by a single individual in a family (Steinglass 1976). Thus, the initiation of heroin use cannot be ascribed to a linear, cause-and-effect model. Rather, heroin abuse is part of a cycle in which each family member's behavior affects and is affected by another member's behavior in reciprocal fashion. As Haley (1973, 1976) and Hoffman (1976) suggest, it is the sequence of interactions and behaviors which serves a homeostatic function for the family; the drug abuse is merely embedded in a host of other actions.

The incomplete loss theory views drug addiction as a means of coping with a traumatic family experience. It is much like Bowen's (1978) "emotional shock wave," which he describes as a network of underground "after shocks" of serious life events that occur anywhere in the extended family system in the months or years following a serious emotional family event. He feels that these usually occur after the death or threatened death of a significant family member but suggests that they could follow other types of losses. Bowen relates the reaction to a denial of emotional dependence among family members and feels that it most often occurs in families with a significant degree of denied emotional "fusion." He illustrates with a case example of a grandmother's threatened death from cancer surgery, followed by a two-year period of a chain of catastrophes among her children and their families. Reactions included drinking, depression, automobile accidents, delinquency, and business failure.

The initial experience with a drug is apt to be associated with age or stage of development. Although the family's sequential interactions are historically unchanged, the first act of drug experimentation generally arises during adolescence (Stanton 1977a, 1979d). Like acne or other age-related phenomena, the predisposing factors have long been present. Drug use is, again, an integral component of the family's relationship patterns and feedback system and its initiation cannot be ascribed to a singular or direct causal factor.

LEARNED BEHAVIOR THEORY *(p. 191)*

Frederick

Drug use is initiated primarily as a function of the destructive components in the personality (Pd) and the risk-taking aspects that predominate in the life of the individual at the time of the onset of substance abuse or addiction (Rd). While there is no drug abusive or addictive personality, per se, it is not unlikely that those with weaker, dependent personality traits may be more inclined toward problems of drug usage than other persons without such traits. Moreover, individuals with rebellious tendencies are also likely to express a greater affinity toward drug use, particularly at certain points in their lives. The reason why drug use occurs at a particular point in an individual's life depends upon cultural influences and drug availability. These components are particularly related to those risk factors involved that are of a deleterious or destructive nature. Of course, some individuals move from alcohol abuse to drugs as a result of these same factors. Arbitrarily, the numerical values already cited may be employed here to illustrate how the counterproductive personality factors and risk factors can be increased and, thereby, can alter the ratio in the direction of initiation of drug abuse/addiction. The basic formula, described earlier, states:

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{2 \times 3 \times 1 \times 5}{3 \times 4 \times 1 \times 5} = \frac{30}{60} = 0.50$$

When the destructive factors (Pd) and (Rd) become affected, the existing equal balance of 50-percent probability changes as follows:

$$\frac{3 \times 3 \times 1 \times 6}{3 \times 4 \times 1 \times 5} = \frac{54}{60} = 0.90$$

The likelihood of drug abuse occurring has now increased markedly, since a value of 1.0 represents the point at which it will unequivocally develop. The next reinforcement of (Pd) or (Rd) or a diminution in the strength of one of the constructive factors will readily bring about drug addiction or abuse.

COGNITIVE CONTROL THEORY *(p. 8)*

Gold

The CAP control theory does not specifically address the issue of initiation of drug use. In today's society almost everyone is exposed to and experiments with some drugs, including alcohol. The drug of preference is likely to be a function of availability, frequency of use in the individual's subculture, and affordability. Drug experimentation is not seen as a sign of psychopathology or personality weakness.

BAD-HABIT THEORY *(p. 12)*

Goodwin

Availability, peer pressure, rebelliousness, family attitudes, and possibly even psychiatric symptoms such as anxiety and depression may contribute to initiation of drug use. Based on other studies, antisocial behavior in adolescence is an important predictor in initiation. My theory would indicate that the genetically predisposed person would more rapidly be initiated into alcohol abuse (and, by inference, other drug abuse) and that the switch from use to abuse would occur very rapidly. We have some data on this. So-called "familial alcoholics" are younger than nonfamilial alcoholics when they start having troubles from alcohol.

MULTIPLE MODELS THEORY *(p. 18)*

Gorsuch

Gorsuch has derived three interactive models for the initiation of illicit drug use: the nonsocialized drug users model, the prodrug socialization model, and the iatrogenic model. The first model describes the propensity for drug use in the nonsocialized person, who, without internalized norms against drug use, will be more susceptible to it. The prodrug socialization model is concerned with those people in whose society drug use is sanctioned. This applies to societies in which drugs are part of religious or other cultural rituals and to groups whose members use drugs for licit purposes. The iatrogenic model pertains to individuals who have been introduced to a drug in a medical setting. These people may seek the drug's beneficial effects again when they no longer have the original medical need.

It is apparent in all these models that availability of illicit drugs is a primary prerequisite to initial use. The nonsocialized individual generally seems to have little real drive to seek out drugs and would be particularly unlikely to do so if drugs were difficult to obtain. However, the iatrogenic and prodrug subculture users are more likely to seek out a drug regardless of its availability, the former perceiving a real and strong need for it and the latter with numerous models for doing so.

In spite of the fact that the usual sources of illicit drugs are through peers, peer intervention has high potential as a prevention measure. If norms of the peer group are antidrug, then the nonsocialized individuals have little chance to partake of the drugs and will avoid initial illicit drug experiences. However, this approach is more problematic where there is a prodrug subculture, for attempts to suppress that subculture could be expected to solidify the group "against the common enemy." But methods which encourage development of antidrug values without suppressing the peer group, such as those used by Carney (1972) and the YMCA (Gorsuch, in press), are effective. For this reason, parenting agents play a crucial role in preventing initial drug use. If they socialize the individual into the traditional, anti-illicit-drug culture, then the individual is much less likely to have an initial drug experience regardless of availability. From a long-term perspective, this is probably the most effective intervention technique. However, it most likely involves a greater depth of understanding of parenting techniques and of teaching such techniques than is currently available. One aspect which could be stressed to parents is implicit prodrug socialization through parental use of drugs. Those parents can be encouraged to discriminate between the drugs of particular importance to their subculture and the illicit use of drugs.

Socializing agents other than parents can also be important. Attitudes toward drug abuse can be readily changed both in school (Carney 1972) and in other settings. The evidence on religious membership (Linden and Currie 1977) suggests that this is a powerful force. In addition, values clarification programs in YMCA settings have also been found to alter attitudes toward drug abuse (Gorsuch, in press).

EXISTENTIAL THEORY *(p. 24)*

Greaves

Initiation of drug use is not seen as a significant issue by Greaves insofar as numerous hypotheses, individually and collectively, seem to adequately explain initiation. These include, but are not limited to, peer pressure, pursuit of novelty, antisocial experimentation, perceived status, curiosity, escape, and sexual stimulation.

ADAPTATIONAL THEORY *(p. 195)*

Hendin

From an adaptive standpoint, initiation of drug use, that is, determination of the circumstances surrounding the individual's first use of drugs, has been overly emphasized, particularly with marijuana and alcohol, which are widely accepted among and available to teenagers. Much of the emphasis on initiation derives from the implication that one has begun a process, and in so doing, has heightened the danger of excess, so that the way to deal with the problem is to stop it before it starts. This is akin to believing that loss of virginity leads to promiscuity. The response to initiating experiences is a more critical and informative variable. For a small percentage that response is so negative that it leads to rejection of further drug use.

Since drug abuse usually grows out of adaptive difficulties, one would expect that the earlier in life the individual finds it necessary to use drugs, the greater the impairment is likely to be. And, in general, the younger the age at which an individual begins drug abuse, the more likely it is that he or she is a disturbed, vulnerable person. The preadolescent (9 to 12 years old) drug abusers seen in the urban ghetto are the most tragic illustration. Initiation in early adolescence usually reflects difficulties in the changing relationship to the family that adolescence brings. Even though these difficulties often stem from early childhood experiences, the individual who can deal with life through adolescence without large amounts of drugs has a better chance of not being destroyed by drug abuse even if he or she becomes involved later.

SOCIAL DEVIANCE THEORY *(p. 90)*

HIII

There appear to be several powerful interacting factors which determine the vulnerability of the social deviant to initial addiction. The first, which has been discussed at some length by others, is that such behavioral equipment is found most frequently in the underprivileged and slum areas in which opiates and other drug supplies have "high" availability (Chein and Rosenfeld 1957; Cohen 1955; Clausen 1957) and in which both narcotic addiction and alcoholism are common. The environmental conditions which produce the deviant in these areas also provide more ready access to opiates than in the larger society, and with regard to both opiates and alcohol, provide a greater degree of exposure to models of excessive use. But, to a more limited degree, this would appear to hold also for the social deviant in all societal strata. Second, lack of social controls (shared responses) appears to determine the degree of acceptability, to the deviant, of experimentation with drugs as well as with other forms of unusual behavior (Chein and Rosenfeld 1957). Although a certain degree of privation and social isolation in the "fringe" areas are contributing factors to social deviance as well as to addiction, they appear to be neither necessary nor sufficient causal antecedents of such behavior.

The following appear to be the chief factors which produce the special vulnerability of social deviants to addiction. They are deficient in daily pursuits which are reinforced by and bring satisfaction to the larger society; they are not deterred from unusual behavior by counter-anxiety, which in the "mature" adult can be partially identified as inhibitions; because of these deficiencies they are especially susceptible to short-term satisfactions, and if drugs are available they can themselves rapidly manipulate their personal state.

One of the most difficult problems in the etiology of the addictions, and one which apparently has a direct connection with specific effects of drugs, is concerned with the use of a particular agent when others are equally available. Alcohol and opiates, although having some effects in common, perhaps even some common effects on conflict and anxiety, frequently produce diametrically opposite actions. It thus seems apparent that alcohol and opiates differentially but specifically alter the probability of occurrence of particular classes of responses.

Briefly, in this connection, it is assumed for the general case that the behavioral equipment of the individual is composed of specific responses or response patterns which have certain probabilities of occurrence (strength) in any given situation. Since different responses of the individual differ in strength, they form a response hierarchy for a given situation ranging from the response which is most likely to that which is least likely to occur (Hull 1934; Miller and Dollard 1941). As an organizing principle in research on psychopharmacology, and for its applicability to the addictions, it is hypothesized that drugs rearrange the individual's response hierarchy in ways which are specific for a particular drug and for a given situation.

BIOLOGICAL RHYTHM THEORY *(p. 262)*

Hochhauser

The chronobiological control theory suggests that an individual who perceives himself or herself in a helpless situation, in terms either of behavioral or internal events, may resort to drug use in an effort to achieve some degree of perceived control over these experiences, especially when other nondrug alternatives are not available or have been found ineffective. In summarizing what is known about these early drug experiences, Gorsuch and Butler (1976a) suggest that initial drug use may occur (1) to respond to a state of physical pain; (2) to deal with mental anguish; (3) to provide relief from boredom through sensation seeking. Future research must focus on the sources of the physical/mental pain and how a particular strategy is selected in order to cope with such pain.

INTERACTIVE FRAMEWORK *(p. 95)*

Huba/Wingard/Bentler

In our current conception, we believe that initiation of drug use, particularly when it occurs during adolescence, is almost entirely derived from self-perceived behavioral pressure resulting from the intimate support system. This support system plays a role in moving the individual to drug use through peer values, models, and reinforcers, and one of inadequacy in reinforcing alternative, healthy behaviors and goals that would inhibit susceptibility to drug use. The personality system plays a much smaller role, with such dimensions as extroversion, leadership or autonomy strivings, and rebelliousness needs seeking fulfillment in drug-taking behavior. This manifestation is particularly true when the majority culture defines drug taking as illegal and dangerous, in which case we posit that a negative psychological cycle may be instigated with initiation into use. The "backlash" effect is captured in the current model by the reciprocal arrows from perceived behavioral pressure to personality (figure 1, p. 96). The "backlash" may also be exacerbated when the individual's felt pressure not to use drugs is communicated to members of the intimate culture who argue convincingly that drug taking is desirable. It should also be noted that financial resources may preclude the initiation of certain forms of drug taking, although this is unlikely within current youth cultures. We do not think that organismic status plays any major role during the initiation stage since the individual has had no direct experience with the mood-altering properties of the drugs. To the extent that individuals attribute their initiation of use to pharmacological properties, we may infer that they have been educated in drug effects by either the intimate culture or sources in the sociocultural influence system.

DRUG SUBCULTURES THEORY *(p. 110)*

Johnson

Initiation to drug use was studied carefully in the 1970s (Johnston et al. 1978; Jessor and Jessor 1977; Jessor 1979; Kandel 1975, 1976, 1978b). All studies show that initiation to marijuana is critical to the initiation to other drugs (except alcohol). Three major factors have been identified in the initiation of marijuana: (1) prior use of alcohol, (2) predisposing factors (sex, family cohesion, political conservatism/leftism, ethnicity, religiosity, etc.), and (3) friends' use of marijuana. Borrowing from reference-group (Sherif and Sherif 1964), differential-association (Sutherland 1939), and social-learning (Akers 1977) theory, drug-subculture theory hypothesizes that the predisposing factors indicate the influence of the parent culture upon youths; parent culture values may also influence the choice of friends and patterns of friendship choice. The activities of friendship cliques are also strongly influenced by the peer culture. Many peer groups, following peer culture values and conduct norms, expect group members to engage in various forms of unconventional behavior of which cigarette and alcohol use are usually begun earliest. In addition, one or more peer group members may, through contact with other friends, by following examples given in the mass media, or by learning via other informal communication (Fine and Kleinman 1979), also orient themselves toward the cannabis subculture and begin use. As the proportion of the peer group or other friends (or other reference group) using marijuana increases, the probability that any individual member will begin using marijuana increases steadily (Kandel 1978b). Nonusers may be directly pressured by friends ("Are you afraid to try pot? It's harmless and gives a great high ") or indirectly pressured because of the belief that most of their friends are using marijuana (even though they may not be) or the feeling that use is expected by their friends.

The actual initiation to marijuana use almost always occurs among relatively close friends, from whom the nonuser learns the smoking techniques and how to define the sensations of intoxication as a pleasurable and valuable experience (Becker 1963; Orcutt 1978; Akers et al. 1979). Thus, cannabis subcultural values and conduct norms are mediated through the peer group. The precise order of events leading to marijuana use probably varies from case to case, and the causal order, if it exists, has yet to be untangled.

Initiation to the nonmedical use of drugs other than marijuana generally occurs after marijuana initiation and subsequent use. Initiation to the cannabis subculture (and to the alcohol misuse subculture) teaches the critical value common to all drug subcultures--the desire to get "high" via the consumption of substances. After this value is learned, euphoric experiences continue to reinforce it, and, as a result, other substances are frequently and easily redefined as potential sources of enjoyment. The neophyte user may also be expected to initiate the use of one or more other substances, to which he or she may be introduced by friends or other associates, thus becoming involved in the multiple-drug-use subculture (Single et al. 1974).

Initiation to the heroin-injection subculture is strongly influenced by having heroin-using friends that may have been gained via extensive involvement in selling marijuana and other drugs (Johnson 1973) and after relatively extensive use of cannabis and other drugs (O'Donnell and Clayton 1979).

DEVELOPMENTAL STAGES THEORY *(p. 120)*

Kandel

The findings that different social psychological factors predict adolescent initiation into different stages of drug use provide evidence for the existence of stages. We have combined the notion that adolescent drug use involves sequential stages with a longitudinal research design in which the population at risk for initiation into each of the stages could be clearly identified. This has allowed us to assess the relative importance of various factors in predicting initial transitions into various types of drug behaviors. The three sequential stages of adolescent drug use are hard liquor, marijuana, and other illicit drugs. Each of four clusters of predictor variables--parental influences, peer influences, adolescent involvement in various behaviors, and adolescent beliefs and values--and single predictors within each cluster assume differential importance for each stage of drug behavior. Prior involvements in a variety of activities, such as minor delinquency and use of cigarettes, beer, and wine, are most important for predicting hard liquor use. Adolescents' beliefs and values favorable to the use of marijuana and association with marijuana-using peers are the strongest predictors of initiation into marijuana. Poor relations with parents, feelings of depression, and exposure to drug-using peers are most important for predicting initiation into illicit drugs other than marijuana.

Thus, at the earliest levels of involvement, adolescents who have engaged in a number of minor delinquent or deviant activities, who enjoy high levels of sociability with their peers, and who are exposed to peers and parents who drink start to drink themselves. The relationship with parental use of hard liquor suggests that these youths learn drinking patterns from their parents. The use of marijuana is preceded by acceptance of a cluster of beliefs and values that are favorable to marijuana use and in opposition to many standards upheld by adults, by involvement in a peer environment in which marijuana is used, and by participation in the same minor forms of deviant behavior that precede the use of hard liquor. By comparison, use of illicit drugs other than marijuana is preceded by poor relationships with parents, by exposure to parents and to peers who themselves use a variety of legal, medical, and illegal drugs, by psychological distress, and by a series of personal characteristics somewhat more deviant than those that characterize the novice marijuana or hard liquor user.

SELF-DEROGATION THEORY *(p. 128)*

Kaplan

Drug use/abuse patterns are among alternative deviant patterns adopted in response to intense self-rejecting attitudes resulting from a history of being unable to forestall or assuage the self-devaluing implications of experiences in normative membership groups (family, school, peers, etc.).

By virtue of the (actual) association between past membership group experiences and the development of intensely distressful negative self-attitudes, the person loses motivation to conform to and becomes motivated to deviate from membership group patterns. Simultaneously, the unfulfilled self-esteem motive prompts the subject to seek alternative (that is, deviant) response patterns which offer hope of reducing the experience of negative (and increasing the experience of positive) self-attitudes.

Which of several deviant patterns is adopted will be a function of the person's history of experiences influencing the visibility and subjective evaluation of the self-enhancing/self-devaluing potential of the pattern(s) in question.

Given the predisposition to adopt some form of deviance, an illicit drug use pattern (rather than patterns of theft, interpersonal violence, suicide, etc.) would be adopted insofar as (perhaps due to the availability of the drug) the behavior was apparent in the environment, the person did not anticipate adverse consequences (e.g., loss of control, incarceration), and did anticipate self-enhancing outcomes (e.g., acceptance by a positive reference group, anesthetization of self-rejecting feelings).

EGO/SELF THEORY *(p. 29)*

Khantzian

My work with drug dependency has focused on individuals in whom the initiation of drug use progressed to drug dependency. Therefore, my understanding of the initiation and subsequent drug use patterns has been necessarily influenced by my experience which involves more extreme cases. Nevertheless, taken from the psychoanalytic perspective, the meaning, causes, and consequences of drug use can be understood best by considering how the personality organization (particularly ego psychological and self structures) of an individual interacts with environmental influences and drug effects. Such an approach can account for and explain both more benign, self-limited degrees of drug involvement, and the more malignant patterns of misuse and dependency. I will focus on the latter instances where initiation has led to more extreme patterns of involvement and dependency.

The nature of the ego and self disturbances of certain individuals leaves them more prone to begin drug use. The nature of these ego and self disturbances is related to failures or deficiencies in drive/affect defense, self-esteem, and self-care. Having failed to develop adequate internal mechanisms for coping with internal drives and emotions, the addiction-prone individual is constantly involved with a range of behaviors and activities, including drug use, in the external world to serve the needs for a sense of well-being, security, and pleasure. Shaky or rigid defenses and low self-esteem cause him or her to turn more exclusively to the external environment for the satisfaction of such needs and wants. Wurmser (1974) has referred to this predisposition as an "addictive search" and has expanded eloquently on how such predispositions are part of the necessary and sufficient causes that lead to addiction. It is the constant search and hunger for satisfactions from one's environment interacting with the more incidental and adventitious influences such as exposure to drugs, availability, and peer-group pressures that determine the initiation of and experimentation with drug use.

The tendency toward initiation and use of drugs of dependence is further compounded by an impairment in a specific ego function called "self-care." Whereas most people would be apprehensive or fearful of the dangers of using such drugs, or might be equally apprehensive about the appeal of such drugs, we have been impressed repeatedly that such worries and fears were never considered by drug addicts and that the eventualities of the drugs' seduction or dangers were never (or insufficiently) anticipated. Such problems are related to self-care (ego) functions that are impaired, deficient, or absent in so many of the addicts we see. The problems with self-care and regulation are apparent in their past histories (predating their addiction) by a high incidence of preventable medical and dental problems, accidents, fights, violent behavior, and delinquent behavioral problems. Their impaired self-care functions are also evident in relation to their drug/alcohol problems, where despite obvious deterioration and imminent danger as a result of their substance use, there is little evidence of fear, anxiety, or realistic assessment about their substance involvement. One might correctly argue that in this latter instance, the lack of self-care is secondary to regression as a result of prolonged substance use. Although this is probably quite true, we have been impressed with the presence and persistence of these described tendencies in such individuals both prior to becoming addicted and after becoming detoxified and stabilized (Khantzian 1978).

GENERAL ADDICTION THEORY *(p. 34)*

Lindesmith

Since the theory is concerned with the development of the characteristic craving of the addict, it does not purport to explain initial use. The first experience may occur in a wide variety of ways, under many different kinds of circumstances, and from a considerable range of motives. It may result from a doctor's prescription and have nothing to do with the motivations of the recipient, who may not even be aware of the nature of the medication. Most contemporary American addicts acquired their initial experience with heroin through association with addicts who obtained the drug from the illicit market. The situation during the 19th century was quite different; initial use then ordinarily occurred in connection with medical practice or self-medication with patent medicines and opiate products that were widely available in drug stores. The situations that lead to the first use of an opiate-type drug vary widely in different parts of the world and tend to change with the passing of time.

It seems probable, considering that opiates constituted the prime therapeutic agent of medicine for close to 2,000 years and that morphine is still perhaps the most valuable analgesic available to doctors, that a considerable percentage of the adult population has experienced at least one dose of an opiate. Initial use, therefore, poses not one theoretical problem but a number of quite different problems. Since most persons who have had the initial experience do not go on to become addicted, the significance of initial use is that it may be thought of as the beginning of a process which may result in addiction, with some kinds of initial use more likely than others to have this effect.

HYPERACTIVE ADOLESCENTS THEORY *(p. 132)*

Loney

Initiation is experimentation with or initial recreational use of those substances (cigarettes, alcohol, marijuana) early in the sequence that ultimately leads to abuse of opiates (Kandel 1975). It is precisely with initiation that our theory is so far concerned. It states that initiation is (1) produced by an interaction between childhood aggression and its familial and social antecedents and (2) facilitated by factors that promote individual susceptibility and substance availability. Among the additional determinants of availability is peer acceptance, which is postulated to be low among exclusively hyperactive youngsters. Low self-esteem, which is linked to aggression in our data, may also increase susceptibility.

Among youngsters treated with CNS-stimulant medication, an additional determinant of susceptibility to substance use is whether the treatment was successful in reducing symptoms (Kramer and Loney 1978). Drug treatment per se probably does not effect a major increase in subsequent susceptibility, since most children have quite negative reactions to ingesting the medication and, despite their positive evaluation of its general effects on their behavior, they are glad to discontinue taking it. However, few drug-treated children speak in terms of external control or adult domination (the "chemical straightjacket" decried by the critics of drug treatment is apparently more an adult concept), and at followup, more medicated youngsters felt that treatment had been a good idea rather than a bad one. At the same time, many of our treated youngsters, like their parents and physicians, feared the development of addiction to the medication, and their most vivid associations to taking stimulants were of unpleasant side effects (e.g., stomach cramps), nuisance, and social embarrassment. Perhaps such associations generalize to all drugs--perhaps only to all orally ingested drugs--or perhaps to all prescribed medications. Or perhaps unpleasant associations remain specific to CNS stimulants.

COMBINATION-OF-EFFECTS THEORY *(p. 137)*

McAuliffe/Gordon

First use of opiates varies according to which of two types of addict is being considered. Among street addicts, use is initiated contagiously by other users, typically for nonmedical or recreational reasons (i.e., pleasure seeking, curiosity, socializing, or going along with the crowd). Among iatrogenic and medical-professional addicts (e.g., physicians), use begins through contact with the drug rather than with users--either as the result of treatment by medical personnel or as the result of self-treatment by medical personnel.

Persons introduced by contagion have usually been involved in the use of other drugs for euphoria, and have considerable interest in trying heroin, even though few actively seek out an opportunity. Younger neophytes more often cite acceptance among and pressure from peers as reasons for trying opiates, but older teenagers have usually heard that heroin produces the ultimate high and want to try it for this reason (Hendler and Stephens 1977, pp. 30-31; Brown et al. 1971). They may also have heard of some unpleasant effects, such as vomiting, but have learned that these are temporary. Despite the apparent casualness of the first try (Chein et al. 1964; Hughes and Crawford 1972; Hendler and Stephens 1977, p. 31), it would be a mistake to regard it merely as a chance occurrence. Most street addicts-to-be are already heavy polydrug users when first exposed to heroin (e.g., Hughes and Crawford 1972; Sheppard et al. 1972, p. 112) and willing to try almost anything. In this sense, they have already developed some addiction (response strength) prior to using an opiate. The intent of use in peer groups is evident in a survey by O'Donnell et al. (1976, p. 67), who found that 75 percent of novices cited "to get high, or stoned" as their reason for using heroin.

In contrast, persons first exposed through treatment or self-treatment (by medical personnel) rarely mention euphoria as a reason for using opiates. Although medical patients treated briefly with opiates for acute problems seldom acquire a strong addiction, patients with chronic disorders run a higher risk. When such patients do develop an attachment to an opiate that is independent of the drug's analgesic properties, unlike street addicts they rarely become interested in euphoric effects since they had no prior orientation toward those effects and since their context of use does not promote hedonistic pursuits. Strongly addicted medical personnel usually begin taking opiates not for recreation, but for pain, fatigue, or treatment of hangover (Jones and Thompson 1958; Little 1971; Pescor 1942; Poplar 1969; Winick 1961a).

COPING THEORY *(p. 38)*

Milkman/Frosch

The predilection toward use of a specific pharmacologic agent is determined by the unique psychophysical and/or sociocultural events in an individual's life. Heroin users may have constitutionally based low stimulus thresholds and phase-specific disturbances in ego development as early as the first year of life. Amphetamine users show ego impairment which may be related to problems in the second or third year. Actual initiation may be related to the development of a seduction-prone personality (Blachly 1970) with seduction thresholds lowered during critical, high-risk periods, e.g., parental separation, negative peer influence during adolescence, etc.

Initiation of a particular psychoactive substance is related to both availability and peer influence. Initiation is not viewed as a singularly sufficient or potent factor in the process of becoming harmfully involved in the use of drugs. Rather, initiation must be coupled with psychophysical and/or sociocultural determinants, predisposing an individual toward continued involvement.

ACHIEVEMENT-ANXIETY THEORY *(p. 212)*

Misra

Persons often get so tired, exhausted, and fed up with the process of trying to achieve the so-called "good life" that they go to the other extreme, namely, to a life that is so individualized, personal, and unique that there is no worry about comparing their achievements with those of "the Joneses." It is in this context that drug addiction surfaces as an attractive relief. The argument runs somewhat like this: "When I take drugs, my feeling is my own; I couldn't care less how it compares with yours or theirs; it is my feeling; I own it. The question of its being better than yours is moot, for it is my feeling, you can't own it; I've achieved my own identity," and so on.

ADDICTIVE EXPERIENCES THEORY *(p. 142)*

Peele

A person can begin to use or try a drug for any of the whole range of human motivations; indeed, the desire to alter consciousness through drug use seems to be nearly universal. The reasons for intial use can determine whether or not the user will ultimately become addicted. In approximately descending order of the likelihood of a motivation leading to addictive use are the following reasons for starting to take a drug: a sense of adventure; a need for stimulation; a desire to emulate others in the peer group; and personal needs, such as to avoid pain, to escape from reality, to gain a predictable gratification in the absence of other life rewards, to compensate for a sense of personal inadequacy. It is these latter ego and life deficiencies which most readily embark an individual on the addiction cycle, although no initial reason for taking a drug is entirely free of these components.

SOCIAL NEUROBIOLOGICAL THEORY *(p. 286)*

Prescott

Factors that are responsible for the initiation of drug and alcohol use are many and varied. From the perspective of somatosensory affectional deprivation (SAD) theory there is first the establishment of a neuropsychobiological predisposition or need for drugs and alcohol. Any factor that contributes to a reduction of afferent activity in the somesthetic (touch) and vestibular (movement) sensory modalities (partial functional deafferentation) from the fetal period of development and throughout the formative periods of postnatal life can be considered as contributing to potential substance abuse. Fetal conditioning to maternal substance usage during gestation may be a variable of some significance in this context (stimulus-seeking behavior at the neurophysiological level). Early separation of newborns from their mothers--a common hospital practice--and continuing "institutionalization" of infants and children (infant nurseries and child day-care centers that are characterized by SAD) are considered to be contributing factors. Failure to breast feed, short-term breast feeding (less than two years) that reflects low nurturance or avoidance of intimacy, and breast feeding that is "mechanical" (reflecting duty and responsibility) and not "joyous" are additional factors for consideration. Permitting infants and children to cry for prolonged periods without providing immediate nurturance and permitting them to cry themselves to sleep are additional contributing factors, as is the intentional infliction of pain upon infants and children. The failure of fathers to be physically affectionate with their infants and children (sons and daughters) is considered to be a variable of major significance for future substance abuse. The failure to provide continuous vestibular stimulation by not carrying the infant throughout the day results in impaired neurointegrative vestibular-somesthetic and other sensory processes that may result in a need for artificial psychochemical stimulation later in life or other forms of compensatory stimulus-seeking behaviors.

Finally, the failure of children to develop close friendships among their peers and the failure of adolescents to develop not only close friendships but intimate caring and affectionate sexual relationships among their peers are also considered to be significant factors in establishing a neuropsychobiological foundation for substance abuse and other aberrant social behaviors (Reich 1973).

NATURAL HISTORY PERSPECTIVE *(p. 215)*

Robins

The introduction to drugs is almost exclusively through friends. Studies agree that almost all users had friends who were using before their own use began. The typical first drug used was a gift from a peer, not a purchase or a prescription. This picture is in marked contrast to the older pattern, in which the physician was often the source of the initial drug exposure. It also differs from the early Government antidrug propaganda, which invented the evil drug "pusher" in the schoolyard giving away free samples to create a market for his devilish products. There has been no need for "pushers" in recent years. At least in the United States, the illicit drug market has definitely been a seller's market.

Since World War II, young drug users have tended to be urban, male, minority-group members, particularly black and Spanish-American. The period of risk for the onset of illegal drug use begins in the teens and ends in the mid-twenties. The behavior of drug abusers prior to the onset of drugs resembles that of mild delinquents, as is discussed more fully in part I.

GENETIC THEORY *(p. 297)*

Schuckit

Alcohol is a legal, readily available, and potent substance which is consumed by almost 90 percent of all teenagers by the end of high school and which, on any one day, is taken by 70 percent or more of the general population (Haglund and Schuckit 1977). The initiation of use of this substance, therefore, may be a response to factors which are quite different from those influencing temporary problems or long-term misuse (i.e., alcoholism).

If "use" is defined as voluntary intake on multiple occasions in any one year, then it is likely that genetic factors play only a minor role. It is possible to hypothesize an inheritance of a certain level of anxiety or of other personality characteristics likely to influence the degree of risk taking one is willing to experience and which may affect the decision to begin to use drugs.

The major factors having an impact on the initial use of a ubiquitous drug like alcohol, however, are more likely to be environmental. Anecdotically, the initiation of alcohol use probably follows experience with caffeine and tobacco and usually precedes experimentation with other classes of drugs, such as marijuana and stimulants (Kandel and Faust 1975). While alcohol intake probably begins in the early teens and becomes more routinized by the end of high school, the chances for initiation of use increase with a history of parental substance use, the degree of life instability (such as school or police problems), and the level of sensitivity to peer pressure. Certain environmental circumstances, such as entering an exceptionally heavy-drinking environment at a time of heightened stress (e.g., living in an isolated armed forces duty station) may also contribute greatly to the initiation of drinking in an individual otherwise not so inclined. Considering how this readily available and legal drug has become equated with a passage from adolescence into adulthood, it is not surprising that the vast majority of Americans at some time in their lives consider themselves drinkers.

It is likely that the same types of factors are involved in the initiation of use of many other drugs. Whether or not one tries the more available substances like marijuana, hallucinogens, or brain-depressing or brain-stimulating drugs probably rests more with social than with biological factors. This would depend upon the type of peer pressure placed on the adolescent, the availability of drugs, parental models of drug use, and passing through levels of experience with the "less potent" drugs, as have been described by other authors (Kandel and Faust 1975). Here again, the ready availability of mind-altering drugs in a highly stressful setting may be important to the onset of drug use even in those individuals who might otherwise never have tried the substances, as exemplified by the high rate of use in Vietnam and the subsequent abstention in individuals returned to their home environment (Robins et al. 1975). For initiation into the "harder" or less available drugs such as heroin, genetically influenced factors such as personality type (e.g., the antisocial personality) may play a more important role. In the theoretical framework presented in this section, the reasons for initiating use may be quite different from those factors leading to repeated intake and persistent abuse.

AVAILABILITY AND PRONENESS THEORY *(p. 46)*

Smart

According to the availability-proneness theory, drug use can start only when the values for both of the factors are above zero for an individual. Users will start using a drug because they meet it in their everyday lives, for example, when their friends, associates, older siblings, or parents use drugs. Drugs may be readily accessible in the school or workplace if there is no strong countervailing tendency not to use them, such as a religious or ethically based proscription. Some proneness is also necessary. In order to begin drug use of many types (e.g., cannabis, tobacco, hallucinogens), the proneness may consist only of an attitude of curiosity or a desire to experiment. Most users of drugs (including the opiates) initially intend to take them only a few times and then to stop. Proneness may be related to unusual stress, anxiety, or boredom, much as occurred among soldiers in Vietnam, many of whom experimented with opiates when they may not have done so at home in the United States (Robins et al. 1974b). The more dangerous the drug, the greater the proneness required in order to take the first dose, given equal availability of each drug. Since drugs such as tobacco and cannabis are known to have a low toxicity and addictive liability, users should require less "proneness" to try them than the opiates or exotic hallucinogens.

PERCEIVED EFFECTS THEORY *(p. 50)*

Smith

Initiation of substance use depends on availability; on behavior and attitudes regarding drug use of role models and "significant others"; on attitudes, beliefs, and expectations regarding the immediate and longer term advantages and disadvantages of use; and on personality characteristics that facilitate or inhibit use.

Although illicit drugs can be purchased at most schools, drugs are not equally available to all students. Availability depends on who the adolescent or preadolescent knows and how he or she is perceived by potential suppliers. If friendship groups include users, availability is greater, and the likelihood of initiation is increased; so is the likelihood of very early use.

Attitudes and behavior regarding substance use on the part of friends and role models (e.g., older siblings, parents, salient members of reference groups) influence the probability of initiation. If use is practiced by (or is acceptable to) such "significant others," initiation is more likely; it is also more likely to occur at an early age.

Although most initiates believe that the benefits of occasional use outweigh its risks, any particular initiate will have varied and mixed attitudes, beliefs, and expectations regarding the potential advantages and disadvantages of substance use. This complex mix of attitudes, beliefs, and expectations generates a net effect representing an overall predisposition that can range from extremely positive to extremely negative. The more positive the net effect, the higher the probability of initiation, and the earlier it is likely to occur.

Longitudinal evidence now available indicates that certain personality characteristics are highly predictive of subsequent substance use. Details regarding these relationships are presented in part 1 in a more comprehensive manner.

LIFE-THEME THEORY *(p. 59)*

Spotts/Shontz

Our data indicate that initiation into the drug culture is more a matter of social exposure and contact than of intense personal need. That is, users do not at the outset specifically seek out drugs to solve personal problems. Rather, they are in a social situation where drug use is common, and a friend offers a sample of a new substance on a trial basis. Rarely are drug dealers or pushers directly involved at this stage. However, once inducted into the drug culture, the user soon discovers that the various substances produce predictably different ego states and hence may be used to provide "solutions" (albeit counterfeit) to problems in personal adjustment. At this point, the user begins a search for those substances or palliatives which are most congruent with his unique needs and concerns.

Usually, the drug of eventual choice is not the first substance the person tries. Most of the men we studied had experimented with a wide variety of drugs before making a commitment to a specific substance or a class of drugs.

As might be expected, alcohol and marijuana are usually the first drugs taken with any degree of regularity. However, there is no evidence that these are maliciously employed by dealers to seduce people into taking more serious substances.

FAMILY THEORY *(p. 147)*

Stanton

Most initial drug use appears to be a peer-group phenomenon of adolescence. It is tied to the normal, albeit troublesome process of growing up, experimenting with new behaviors, becoming self-assertive, developing close (usually heterosexual) relationships with people outside the family, and leaving home. This stage is nearly always accompanied by a certain amount of rebellion and self-assertion, and the use of drugs as a means for such expression is certainly abetted if parents indulge in compulsive drug use or heavy drinking themselves. Obviously, drugs are now more a part of the process than they were, but if we had no drugs, other things would probably take their place. Programs aimed simply at keeping all young people from trying a substance several times may be overly ambitious, even if nobly intended. Blum (1972) has concluded that drug education has rarely helped young people's decisionmaking about use, and, further still, he states that actual failure experiences may be what are needed in order for youth to reorient toward less dysfunctional alternatives. The problem may be more one of parental fears than of actual dangers. This is not to deny harmful drug effects so much as to question how effectively we can prevent young people from doing a few "stupid" things, whether drug related or not (Stanton 1979b). One might legitimately ask, then, how realistic it is for adults to mobilize and direct energy to eradicate one symptom of a process that will probably always exist.

In other cases, drug use can initiate in response to other types of stress, such as (a) with the "empty nest" syndrome, (b) with families facing an economic or other sort of crisis, (c) with family deaths or losses, or (d) when parents immigrate from other countries or other sections of the same country. As with adolescence, these are stages within the family developmental life cycle, and they require new coping and readjustment to the alterations of the family structure which accompany them (Minuchin 1974; Stanton 1979a,b,c, 1980).

From a broader perspective, much of the drug use (and misuse) vis-a-vis the family stems from changes in the fabric of the larger society. Bronfenbrenner (1974) lists a number of societal trends (fragmentation of the extended family, use of television as a substitute for child supervision, etc.) which have led to alienation and isolation of young people from others older and younger than themselves; the informal peer group has filled in the vacuum. In addition, belief in (and media coverage of) the efficacy of drug consumption, with a concomitant increase in overall adult drug usage, have served to provide a proper setting for greater drug use and misuse by citizens both old and young. In this sense, drugs are a symptom and a result of societal trends and of the relationships among people within the society (Stanton 1979b).

SELF-ESTEEM THEORY *(p. 157)*

Steffenhagen

The preservation of the "self" is the most important variable underlying human behavior. Drug use is a compensatory mechanism, an excuse for life's failures, which can insulate one from social responsibility. Low self-esteem can provide the impetus for initiation for one looking for immediate gratification, but low self-esteem, by itself, is not sufficient to account for initiation into drug use. For that we have to look to the social milieu which provides the basis for such initiation. The peer group provides the greatest pressure and opportunity for the initiation into drugs, although we have to look to a wider community to see what drugs are provided, and how: One cannot use a drug which does not exist or for which the zeitgeist is not right. For example, marijuana has been known since the colonial period in the United States but did not become popular until the late 1960s.

CYCLICAL PROCESS THEORY *(p. 164)*

van Dijk

In principle, drugs are taken for their desired pharmacological effect or action on mood states, although there is a wide variability for any specific drug effect across individual users. Personal factors encompass: (a) need for relief from feelings of intense discomfort or tension; (b) absence of possibilities to master, sublimate, or canalize such feelings, and (c) occasional influence of such factors as age (e.g., there is increased risk during adolescence), or the potentially debilitating effects of physical and psychiatric illness. The social meaning of a drug (and of drug taking) is viewed as critically important in the motivation to use the drug, but also as an important influence on the individual's perceived effect of the drug. Social meanings and values of a drug and drug taking entail such factors as its cultural or subcultural acceptance, ritualization, social and legal norms and sanctions, the symbolic significance of the drug (i.e., a symbol for masculinity, potency, or perhaps nonviolence and nonauthoritarianism), and as a signifier of in-group or out-group membership.

CONDITIONING THEORY *(p. 174)*

Wikler

Psychoanalytical theories of addiction virtually ignored the specific pharmacological actions of the drug of addiction but stressed the importance of alleged intrapsychic "impulses" and "archaic longings." Thus, Rado (1933) stated, ". . . not the toxic agent, but the impulse to use it, makes an addict out of a given individual." Fenichel (1945) wrote, ". . . origin and nature of addiction are not determined by the chemical effect of the drug but by the psychological structure of the patient." Be this as it may, the author is not aware of any data on the results of psychoanalytical therapy in the treatment of addicts; indeed, apart from the prohibitive cost of such therapy, it would seem that in view of the prevalence of psychopathy (sociopathy) and thinking disorder among detoxified opioid addicts (Hill et al. 1960; Monroe et al. 1971), psychoanalytical therapy would be futile. Furthermore, the fact that rats and monkeys, equipped with intravenous cannulas for self-injection, will readily take and maintain themselves on morphine, amphetamines, cocaine, and pentobarbital (Schuster and Thompson 1969) casts some doubt on the necessity of such psychoanalytical variables for the genesis of addiction.

In the cases of young persons with prevailing moods of hypophoria and anxiety and with strong needs to belong to some identifiable group, self-administration of heroin is often practiced in response to the pressure of a heroin-using peer group in a social environment in which such a peer group exists.

ROLE THEORY *(p. 225)*

Winick

Our three-pronged theory suggests that the incidence of drug dependence will be high in those groups in which there is--

1. Access to dependence-producing substances;
2. Disengagement from proscriptions against their use; and
3. Role strain and/or role deprivation.

A role is a set of expectations and behaviors associated with a specific position in a social system. A role strain is a felt difficulty in meeting the obligations of a role. By role deprivation, we mean the reaction to the termination of a significant role relationship.

A role approach can help to minimize fruitless debates over whether one specific factor is more important than another in the genesis of drug dependence, because role is a sufficiently dynamic concept to subsume a number of other dimensions.

Instead of having to say that people become drug dependent in order to meet their personality needs, we are suggesting that it is possible to locate the structural sources of role strain and deprivation within the social system. We hypothesize that all points of taking on new roles or all points of being tested for adequacy in a role are likely to be related to role strain and thus to a greater incidence of drug dependence in a group. We also hypothesize that incompatible demands within one role, such as between two roles in the same role set, are likely to lead to a greater incidence of drug dependence.

One clear application of the theory is to persons whose drug of choice is heroin. Heroin users are likely to be persons whose substance use is overdetermined and who have a multiplicity of problems and difficulties, whereas users of other substances are more likely to take them for specific problems (Blum and Blum 1969). Heroin users are therefore persons who are especially likely to experience role difficulties.

DEFENSE-STRUCTURE THEORY *(p. 71)*

Wurmser

Psychodynamically, initiation, repetition, and resumption of compulsive drug use follow a similar, fairly typical pattern that can be summarized in the following circular schema. It starts out (1) with the narcissistic crisis, leading (2) to overwhelming affects, to an affect regression, a radicalization of these feelings. (3) As direct affect defenses, the closely related phenomena of splitting (ego splits) and fragmentation are deployed. The defense in form mainly of denial, but also of repression and other "mechanisms," is carried out partly by psychological means alone, partly and secondarily by pharmacological propping up (pharmacogenic defense). (4) The latter requires an additional form of defense, the element most specific for this syndrome among this constellation of seven, the defense by externalization, the importance of reasserting magical (narcissistic) power by external action, including magical "things." (5) This reassertion of power by externalization requires the use of archaic forms of aggression, of outwardly attacking and self-destructive forms of sadomasochism. (6) In most cases this is only possible by a sudden splitting of the superego and defenses against superego functions. (7) The final point is the enormous pleasure and gratification which this complex of compromise solutions of various instinctual drives with various defenses brings about. Most importantly, the acute narcissistic conflict appears resolved, for the moment, but, as Rado (1933) described, the patient is caught in a vicious circle: "The elation had augmented the ego [now we would say the self] to gigantic dimensions and had almost eliminated the reality; now just the reverse state appears, sharpened by the contrast. The ego is shrunken, and reality appears exaggerated in its dimensions." The patient is not merely back at the start, but on a still lower level of self-esteem.

Continuation

PERSONALITY-DEFICIENCY THEORY *(p. 4)*

Ausubel

To the psychological motivation for drug abuse, i.e., the desire for its adjustive euphoric effects on the part of the inadequate personality, is added the need to continue chronic use in order to avoid unpleasant abstinence symptoms. The latter syndrome, however, is a relatively minor factor in comparison to the addicts' desire for the "high," as they themselves readily admit; the threat of abstinence symptoms only adds an element of uncertainty and urgency to the desire. In fact, addicts often delay administration of the "fix" because such delay significantly enhances the high.

The relatively minor role of withdrawal symptoms in perpetuating the continuation of all further drug use once addiction occurs is supported by the facts that addicts use up to 30 times the daily dosage needed to suppress withdrawal symptoms; that eventually, in most cases, addicts "shoot" the drug "mainline" to enhance the euphoria (running the risk of septicemia, thrombophlebitis, syphilis, malaria, and hepatitis), when simple hypodermic use would effectively suppress abstinence symptoms; and that many medically addicted normal personalities, who become physiologically dependent in the course of treatment for major surgery, accidents, massive burns, etc., easily overcome their physiological dependence, inasmuch as narcotics have no psychopharmacological adjustive value for them. In my view, it is difficult to believe that addicts would accept social ostracism and the hazards of supporting their habits simply to avoid an only moderately severe 10-day illness unless opiates had adjustive psychopharmacological value for their particular personality structures.

Claims regarding intracellular "tissue hunger" for heroin following chronic use (Dole and Nyswander 1965, 1967) and the so-called idiosyncratic development of atypically severe withdrawal symptoms that lead to chronic addiction (Lindesmith 1947) appear to me to be purely speculative. The so-called "blockade" value of methadone maintenance in preventing heroin highs (Dole and Nyswander 1965, 1967) is not convincing because no acquired tolerance for any drug is absolute in nature and, in any case, is relative to the doses of both the methadone and the heroin used. Many MMTP (methadone maintenance treatment program) patients admittedly achieve chronic subliminal highs on their stabilized methadone dose, or even more blatant highs by "doubling up," by discontinuing methadone use prior to shooting heroin, or by using massive doses of heroin.

ADDICTION-TO-PLEASURE THEORY *(p. 248)*

Bejerot

It is biologically normal to continue a pleasure stimulation when once begun. To interrupt it spontaneously is associated with cultural attitudes (sin, guilt, and shame), fear of complications, or strong pleasurable stimuli from other sources.

DISRUPTIVE ENVIRONMENT THEORY *(p. 78)*

Chein

A positive reaction to heroin does not always occur with the first shot. But the inadequacies that drove a person to trying the first time will encourage him to try again, hoping to capture the increased confidence, the sense of serenity and relaxation he observes in regular users. After a time, he finds that heroin offers pleasurable relief in situations of strain. If the young person's daily life contains strain and frustration, the relief brought by the drug comes to be welcome at any time. Simultaneously, the drug makes it easy to deny and to avoid facing the deep-seated problems that led to his experimenting with drugs originally.

INCOMPLETE MOURNING THEORY *(p. 83)*

Coleman

The conceptual foundations of the incomplete loss theory provide the rationale for continuing heroin abuse. The circular, homeostatic model as elaborated by Stanton (1977b) and Stanton and Coleman (1979) explains the means by which drug use is reinforced and maintained. This model is based on a complex set of feedback mechanisms which involve, as a minimum, a triadic family subsystem, most likely mother, father, and drug abuser. In contradistinction to the linear or causal chain of family events, the circular model suggests that the incomplete mourning of a deceased member (or other loss experience) keeps the family in a continuous grieving process. Because they have not mastered the loss, the drug abuser becomes the revenant of the deceased and is encouraged to stay close to the family. When he or she attempts to leave home, a family crisis ensues and he or she will be "called back." As Coleman and Stanton (1978) and Stanton et al. (1978) suggest, these families would rather have the addict dead than lost to outsiders. The "moving in and moving out" of the addict serves a family maintenance function and preserves the homeostasis. It is part of the cycle of interlocking behaviors and, if the addict should die, another member will most likely start to use drugs, insuring the family's enmeshment in an endless cycle of mourning, loss, and mourning.

Bowen (1978) describes a similar cyclical phenomenon among alcoholic families. He suggests that the symptom of excessive drinking occurs when family anxiety is high. The emergence of the drinking stimulates even higher anxiety among those who are dependent on the drinker. The higher the anxiety, the more other family members react by anxiously doing more of what they are already doing. Thus the process of drinking to relieve anxiety and the increased family anxiety in response to drinking can either lead to a functional collapse or the process becomes a chronic pattern.

LEARNED BEHAVIOR THEORY *(p. 191)*

Frederick

The use of drugs is continued largely because of the increase in the habit factor (H) in the equation described in part 1. The increase in the strength of the drug habit is a direct function of the number of reinforcements. As the tension and anxiety are reduced, the strength of the habitual act grows. No other component is necessary to effect a satisfactory explanation of the continuation of drug usage. Habits are the singularly most clearly demonstrable factor in the learning sequence of drug-related behaviors. As the figures chosen to illustrate this phenomenon indicate, one can hypothetically demonstrate how the continuation of drug usage maintains itself by doubling the habit value in the numerator. Thus, drug usage can easily continue for a great length of time, since the probability of drug usage has now reached the value of 1.0. The decay, extinction, and growth of every salient factor inevitably will contribute to the strength of each and, thereby, become manifest in the relationship between constructive and destructive factors to patterns of drug usage. The important thing to remember, however, is the fact that a small increase in the value of a single factor can become both a necessary and a sufficient condition for the development and continuation of drug usage. This is particularly so when a habit has already begun to gain strength in the complex but delicate equation of abusive/addictive behavior. In substituting the values previously shown, when the small value of (Hd) is doubled in strength, the formula becomes unequivocally abusive/addictive.

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{2 \times 3 \times 2 \times 5}{3 \times 4 \times 1 \times 5} = \frac{60}{60} = 1.0$$

COGNITIVE CONTROL THEORY *(p. 8)*

Gold

Continued use of drugs depends upon users' obtaining the desired cognitive-affective-pharmocogenic effects. If drug taking helps persons feel good about themselves, decreases their anxiety levels, and most importantly, makes them believe they are in control of their lives, drug taking is likely to continue. Usage is predicted to continue and increase unless the individual has alternative ways of feeling good about himself or herself. Thus, the individual most likely to move from experimentation to continued usage is having difficulty coping with anxiety and, most critically, believes that continued effort or struggling will not be successful.

BAD-HABIT THEORY *(p. 12)*

Goodwin

The drive behind continued heavy, destructive use of a substance results from the "addictive cycle," in which the individual is constantly seeking to relieve aversive effects from the substance rather than to reproduce initial positive reinforcing effects. In fact, continued use may be motivated by a need to do both: feel good and stop from feeling bad. The essential point is that continued abuse of a drug producing harmful effects suggests "addiction," and one theory of addiction (mine among others) is that the person uses the drug more to relieve bad feelings from the drug than to achieve good. In other words, during the period of drug use and for a time afterwards, the abuser is experiencing a series of minihangovers and what drives the use to destructive levels is the repeated attempt to relieve subclinical withdrawal symptoms.

MULTIPLE MODELS THEORY *(p. 18)*

Gorsuch

The research literature has not distinguished carefully between initial and continuing stages of drug involvement, but some studies (e.g., Jessor and Jessor 1978) suggest that the causative factors in initial use are still at work in continuing drug involvement. The nonsocialized individual will continue to use drugs based upon availability and motivating factors such as sensation seeking. The prodrug socialized person will continue use as an expression of habitual involvement in that culture and from a conformative motive. The iatrogenic drug user continues to seek drug benefits on occasions of mental or physical anguish.

But for continued drug use there is one other feature which is unique and has potentially powerful effects: the initial drug experience itself. Unfortunately research in this area is difficult since most descriptions of the initial drug experience are reported long after that experience has occurred and are influenced strongly by later perceptions. General retrospective studies give expected conclusions: Those who continue their experience report positive initial experiences. Those who stop after the first initial experience feel that they might have continued use except for the bad experiences.

The existence of a drug-using peer group appears important to the continuing use of illicit drugs. First, psychological research suggests that interpretation of the drug experience is influenced by the setting and group norms. If the initial experience is with prodrug peers, the peers would encourage positive interpretations of initial experiences and provide support to reduce the negative aspects which might occur, thus encouraging continued drug experiences. Second, continuing illicit drug users tend to replace their previous friends with new friends who are also drug users. This has not only the advantage of camaraderie but also of providing ready access to drugs. The drug peer group may become somewhat stronger than other peer groups for two reasons. First, there is societal pressure against illicit drug use. This means that the individual must rely upon a close network of associates who are also drug users in order to guarantee availability of the drug, thus encouraging a distinctive subculture. Second, although the research is not conclusive on this point, it may be that those in the nondrug culture reject the drug users, who are then left only with other drug users as potential friends. (Note that this occurrence will cause a shift from the iatrogenic or nonsocialized model to the prodrug socialization model.)

Iatrogenic drug users seem to be least likely to become involved in a drug peer group. Their need is the obvious one of satisfying a particular internal motivation which has little relationship to other people. Indeed the primary motivation is one of return to normalcy, not the development of a new lifestyle. Availability through peers is not a critical factor in this model, as people in this group generally have medical or quasi-medical sources.

EXISTENTIAL THEORY *(p. 24)*

Greaves

This theory makes no unique contribution to the understanding of continued use. Such use may be indicative of excessive dependence on "passive euphoria," may be situational in character, or may be related to peer-group pressure or other social psychological effects. In any event, except for the illegal status of most drug use, guilt reactions, and anxiety reactions, drug use, as such, is felt to be of little clinical significance.

ADAPTATIONAL THEORY *(p. 195)*

Hendin

Continuation of drug use on an occasional basis may occur if the drug relieves tension, increases sociability, or just makes the individual feel better. Continuation on a regular basis without abuse suggests that the drug suits the individual's adaptive needs. Although such controlled use may not present a problem, most drug abuse usually begins this way.

It is important to define the adaptive functions a particular drug or drugs serve. Is the drug used to deal with the rage and frustrations of relationships within the family? (Zinner and Shapiro 1974) Is it used, as marijuana often is, to ease the pressure of academic life? (Hendin 1973a) Is it used, as amphetamines often are, to push young women toward achievement that runs counter to their inner feelings? (Hendin 1974b) Is it used, as heroin often is, to create a barrier to intimacy? (Hendin 1974a) Is it used to achieve a defensive fragmentation, as psychedelics often are? (Hendin 1973b, 1974c)

Adolescence is a period in which youngsters experiment with many forms of behavior that they then reject as not suitable for themselves. It is from this perspective that the occasional heavy use of drugs for a brief period of time must be evaluated. During a one- to two-month period of experimentation with heavy use, such youngsters would seem to be drug abusers; over a longer period it becomes clear they are not.

BIOLOGICAL RHYTHM THEORY *(p. 262)*

Hochhauser

Whether or not a given drug, or combination of drugs, continues to be used will be a function of the efficacy of the drug(s) in meeting the physiological and psychological needs of the user. If the drug(s) permits some degree of control over environmental experiences or internal perceptions, it may continue to be used. If the drug is found effective in affecting either the regularity or the amplitude of the chronobiological rhythm, its use may continue.

INTERACTIVE FRAMEWORK *(p. 95)*

Huba/Wingard/Bentler

Drug taking is maintained primarily by its reinforcing effects, broadly conceived. These effects may be in the form of alleviation of pressure to perform undesirable behaviors, affect enhancement, a change in organismic status, or desirable consequences on the personality, cognition, perception, or consciousness systems. Thus, psychopharmacological reaction to the drug is but one type of reinforcer. Systems which are directly affected by the ingestion of drugs may themselves secondarily influence other systems. For instance, changes in psychological status or of perceived behavioral pressure may cause an individual to redefine members of the intimate culture, alter family relationships, or change friends. To the extent that such direct and indirect changes are ultimately desirable to the individual, in either the short or the long term, drug taking will be maintained.

We would like to differentiate between early and later stages of maintenance, particularly for those drugs which foster either physical or psychological dependence. During the early stages, drug effects are probably evaluated by the individual as desirable because they change the systems in a way that is psychophysiologically desirable. That is to say, the ingestion of the drug serves to enhance some positive psychological function for the individual. During the later stages of maintenance, or dependence, it is likely that the effects for the individual are primarily those of warding off the unpleasant organismic effects associated with cessation of the drug; these effects may operate directly on behavior without psychological mediation.

DRUG SUBCULTURES THEORY *(p. 110)*

Johnson

After initiation to marijuana use, the cannabis subculture's maintenance conduct norms begin to apply. The new user is expected to use marijuana when offered; to seek out marijuana; to become as frequent a user as others in the group; and to learn the appropriate argot, rituals, and symbols of subculture participation. The routine and continued consumption of marijuana becomes defined as normal; what was once a risky and innovative behavior is now an expected behavior for all peer group members. As a person becomes increasingly involved, he or she will develop a self-identity as a marijuana user, which may become an important identity or role (Rubington and Weinberg 1973; Kandel 1975). In addition, other users and nonusers may informally label the person as a marijuana user. Thus, in a process that Lemert (1972) calls secondary deviance, the user may attain a social and self-identity as a user.

As marijuana use becomes increasingly regular, three major conduct norms of this drug subculture become operative. The user is expected to buy some marijuana and/or provide marijuana to others in the peer group (reciprocity conduct norms). While buying cannabis, the user will frequently be greeted as a friend by the seller and receive offers of an introduction to other drugs or may gain new friends who use other drugs. In addition, the regular user is increasingly expected to provide and to make small purchases to give or sell to friends; this reflects involvement in the cannabis subculture's sharing conduct norms and low-level distribution conduct norms. Of course, these low-level cannabis transactions violate criminal law (the potential penalties are serious), but as with regular use, such transfers quickly become defined as normal by subcultural standards.

Abiding by the maintenance, reciprocity, and distribution conduct norms of the cannabis subculture greatly increases the probability of adopting as a reference group (Sherif and Sherif 1964) and gaining friends among those who use other drugs. The process of initiation to other drugs appears to be similar to that for cannabis, with the person's frequency of cannabis use and the number of friends using other drugs being the immediate precursors to initiation to a specific substance (Johnson 1973; Kandel 1978b). The multiple-drug-use subculture has somewhat different maintenance conduct norms than the cannabis subculture. Participants are expected to use a variety of substances, although certain drugs may be emphasized within a particular peer group (Waldorf et al. 1977; Feldman et al. 1979). The weekly or more regular use of one noncannabis substance, however, is relatively uncommon, although two or more noncannabis drugs may be used during the week (Division of Substance Abuse Services 1978). Frequently, reciprocity and distribution conduct norms of the multiple-drug-use subculture are critical to the specific drugs used. That is, if one member of a peer group has a supply of barbiturates, these will be shared and used by other members. If peer group members who wish to use LSD cannot find a dealer or supplier, they may buy and use another drug that will be offered, such as PCP or stimulants. Thus, the actual drug(s) used by peer groups or individuals is closely related to patterns of drug supply and availability within the community.

Multiple substance use continues for an individual mainly as a function of peer group activity. To the extent that the peer group seeks and obtains drugs as a source of recreation and a desired activity, the more regular the use episodes and the more different substances eventually used. While the individual learns the rituals, argot, and street pharmacology associated with various noncannabis drugs, the development of a social identity or a self-identity as a noncannabis drug user does not appear to be as strongly held as the identity of "pothead" or "addict." Persons who develop a strong self-identity or who acquire a social identity as a noncannabis drug user generally specialize in or heavily use a particular drug--which they frequently sell. But for every weekly user of a specific noncannabis, nonheroin drug, there are probably ten or more persons who abide by the multiple-drug-use subculture conduct norms of using several different substances during a given time period and who use drugs in relatively low dosages in a controlled manner (Waldorf et al. 1977; Zinberg 1979; Division of Substance Abuse Services 1978).

The conduct norms of the heroin-injection subculture expect the individual to seek heroin constantly, to inject it at least daily, and to spend most resources to obtain heroin. While many heroin injectors have some days of nonuse (Johnson et al. 1979), the individual tends to remain routinely involved in the heroin-injecting subculture's role structure (as a user, buyer, or seller), participating in subculture argot and rituals, committing minor and major crimes to finance heroin purchases, and evading law enforcement. The individual quickly develops a self-identity as an addict, which is reinforced by the necessity for interacting with other heroin injectors and dealers to obtain the drug, and by social labeling and rejection by nonheroin-using family, friends, and neighborhood acquaintances.

DEVELOPMENTAL STAGES THEORY *(p. 120)*

Kandel

At this time in history in the United States, adolescents' involvement in drugs appears to follow certain paths. Beer and wine are the first substances used by youth. Tobacco and hard liquor are used next. The use of marijuana rarely takes place without prior use of liquor or tobacco, or both. Similarly, the use of illicit drugs other than marijuana rarely takes place in the absence of prior experimentation with marijuana.

The documentation that different factors are important for different drugs provides additional support for the claim that drug involvement proceeds through discrete stages. The notion of "stage" itself allows a more fruitful specification of the role and structure of different causal factors at different stages of involvement.

For example, as regards interpersonal influences, we find at different stages not only differences in source of influence but also differences in the aspects of interpersonal influences that are important. In the early stage of drug use, parental behavior seems to be critical in leading the youth to experiment with hard liquor. In later phases of initiation, the quality of the parent-child relationship becomes important, with closeness to parents shielding adolescents from involvement in the most serious forms of drug use. Similarly, there is evidence that a generalized peer influence, which is important in predicting initiation to legal drugs and marijuana, is partially supplanted by the influence of a single best friend in leading to the initiation of other illicit drugs. Findings of this kind point to the importance of examining profiles of interpersonal influences over a series of behaviors, values, and attitudes in order to better understand their dynamic nature. Thus, if one accepts the notion that progressively more serious involvement in drugs underlies the stages we have outlined, the data suggest that the more serious the behavior, the greater the relative importance of the specific role model provided by one friend in contrast to the same behavior of the whole group.

Similar specification occurs with respect to the role of participation in deviant behaviors. Participation in various deviant behaviors is most relevant in starting to use alcohol, least for illicit drugs. The less serious the drug, the more its use or nonuse may depend on situational factors. By contrast, initiation into illicit drugs other than marijuana appears to be a conscious response to intrapsychic pressures of some sort or other.

Many theories of drug dependence offer some concept of individual pathology as a primary explanation, while others stress social factors. Each of these concepts may apply to different stages of the process of involvement in drug behavior, social factors playing a more important role in the early stages; psychological factors, in the later ones.

The identification of cumulative stages in drug behavior has important conceptual and methodological implications for identifying the factors that relate to drug use, either as causes or as consequences. In a longitudinal analytical framework, there should be decomposition of the panel sample into appropriate subsamples of individuals at a particular stage who are at risk for initiation into the next stage. Since each stage represents a cumulative pattern of use and contains fewer adolescents than the preceding stage in the sequence, comparisons of users and nonusers must be made among members of the restrictive group, which has already used the drugs at the preceding stage. Otherwise, the attributes identified as apparent characteristics of a particular class of drug users may actually reflect characteristics important for involvement in drugs at the preceding stage(s). The definition of stages allows one to define a population at risk and to isolate systematically, within that population, those individuals who succumb to this risk within a specific time interval.

The notion of "stage" itself is somewhat ambiguous. Among developmental psychologists, controversy exists about whether the notion of stages implies that development must necessarily occur in a hierarchical and fixed order, as Piaget, for example, proposes. However, the notion of invariance must be subjected to empirical test. This is especially important for drug behavior. Indeed, as regards the notion of stages in drug use, two reservations must be kept in mind. To date, the stages have been identified in populations of American adolescents. The specific sequences are probably culturally and historically determined. Crosscultural studies are required in order to determine the extent to which the order that has been observed is in fact an invariant one. These studies would indicate whether or not involvement in illicit drugs is always preceded by use of legal drugs, as appears to be the case in the United States, or whether, in certain cultures, involvement in cigarettes, alcohol, and marijuana proceeds along parallel and nonoverlapping paths. Furthermore, while the data show a very clear-cut sequence in the use of various drugs, they do not prove that the use of a particular drug infallibly leads to the use of other drugs higher up in the sequence. Many youths stop at a particular stage without progressing any further. Nor can the findings be interpreted to show that there is something inherent in the pharmacological properties of the drugs themselves that leads inexorably from one to another.

SELF-DEROGATION THEORY *(p. 128)*

Kaplan

Following adoption of the drug use/abuse pattern, to the extent that the person in fact experiences self-enhancing consequences, is able to defend against any intervening adverse consequences of the behavior (anticipated or unanticipated), and does not perceive alternative responses with greater self-enhancing potential, the pattern is likely to be confirmed. The deviant response has self-enhancing consequences if it facilitates intrapsychic or interpersonal avoidance of self-devaluing experiences associated with the predeviance membership group, serves to attack (symbolically or otherwise) the perceived basis of the person's self-rejecting attitudes (that is, representations of the normative group structure), and/or offers substitute patterns with self-enhancing potential for behavior patterns associated with the genesis of self-rejecting attitudes.

EGO/SELF THEORY *(p. 29)*

Khantzian

Not surprisingly, the influences operating to cause the initiation of drug use are intimately linked to the causes that predispose to the continuation of drug use, namely, impairments in self-care and the tendency to seek and search for external solutions, including drug use, to what are internal problems in coping with emotions and need satisfaction.

The likelihood of continuation in the addiction-prone individual is also enhanced because of a very important discovery, namely, that certain drugs have a specific appeal based on a constellation of emotional problems and personality organization with which such a person struggles. I have referred to this process as one of "self-selection," in which a person discovers that the short-term effect of a certain drug results in improved functioning or sense of well-being by augmenting shaky or impaired defenses, or by producing a release of feelings from rigid and constraining defenses.

The stimulants, amphetamine and cocaine, have appeal because of their energizing properties. They overcome fatique and depletion states associated with depression. The problem with many drug-dependent individuals is that they are unable to identify and verbalize their feelings, and their depression is only vaguely or dimly perceived (Krystal and Raskin 1970). Thus, they particularly welcome a drug that helps to override such vaguely perceived dysphoria. The stimulants improve self-esteem, assertion, and frustration tolerance (Wieder and Kaplan 1969) and eliminate feelings of boredom and emptiness by engendering feelings of invincibility and grandiosity as the drugs relieve depression (Wurmser 1974).

Sedative-hypnotics and alcohol help to overcome neurotic inhibitions and anxieties, but their main appeal resides in their action of overcoming rigid defenses that stand in opposition to primitive narcissistic longings. Krystal and Raskin (1970) have stressed how such individuals have adopted rigid defenses against affectionate and aggressive feelings toward the self and others because of enormous difficulties with ambivalence. The short-acting hypnotics and alcohol are enjoyed and used because they allow the brief (and therefore tolerable) experience and expression of these feelings.

My own specific contribution to the notion of self-selection has centered around the anti-aggression action of opiates. I attempted in my early reports to explore systematically how problems with aggression predispose and play a central part in a person's becoming addicted to opiates. In this work I emphasized the disorganizing influences of rage and aggression on the ego and how the anti-aggression and muting action of opiates helped the person to cope by counteracting and relieving the dysphoric states associated with such rage and aggression (Khantzian 1972, 1974).

GENERAL ADDICTION THEORY *(p. 34)*

Lindesmith

If use continues after the initial experience, and if the use is such that the effects of each dose do not overlap those of the preceding and following ones, the characteristic craving does not appear as long as this episodic use lasts. I am acquainted with a person who has used heroin in this manner for around 40 years without becoming addicted. This outcome is implied by the theory since physical dependence and withdrawal distress are absent when use is irregular in this manner.

During such a period of use, users tend to become confident of their ability to control usage and commonly develop a firm belief that they cannot become addicts. Their attitudes toward addicts tend to be negative, like those of most nonaddicts. They often say, when queried on this matter, that they are unable to understand why an addict would make the enormous sacrifices and take the risks that are necessary to obtain a drug which, from their own direct personal experience, is not all that wonderful or sensational. Ordinary citizens who have experienced the effects of morphine in medical practice usually express this same attitude of noncomprehension. From experiences with the drug, this type of user naturally learns about the usefulness of opiates in relieving pains and discomforts of various sorts. This, coupled with a feeling of invulnerability to addiction, can readily lead to carelessness in the spacing of shots and trigger the regular daily usage that creates physical dependence.

All of the above is implied in the theory, since it attributes the craving to effects of opiates experienced after the initial effects have been reversed by physical dependence. Irregular users experience only the initial effects of the drug; they have never had the dramatic and crucial experience of knowingly using a shot to relieve and banish withdrawal suffering.

HYPERACTIVE ADOLESCENTS THEORY *(p. 132)*

Loney

Little is known about the determinants of continuation, as distinguished from those of initiation, although it is clear that they may be different (Robins 1975b). The antecedents of initial drug choice have been hard to determine, and the reasons for drug preference are even more difficult to elucidate. Many believe that stimulant drug treatment increases the probability of drug abuse by changing the child's attitudes toward himself or herself and toward legal and illegal substances, but the value of soliciting the attitudes and reactions of hyperkinetic children to their condition or to its treatment has only recently been brought to our attention (Whalen and Henker 1976). Hechtman et al. (in press) found that more classmate controls reported using hallucinogens than did hyperactive youngsters, and it would be easy to believe that previously hyperactive adolescents might experiment impulsively but then discontinue using those substances that proved disorganizing. One might postulate that hyperkinetic children would be especially likely to continue using stimulants because of their "paradoxically" calming and therapeutic effect. Research on the responses of normal children to CNS stimulants (Rapoport et al. 1978) suggests that the responses of hyperkinetic children are not paradoxical at all. However, the alerting and organizing effects of stimulants might be similar for both hyperkinetic and normal children, but especially reinforcing to children with residual attentional deficits. Schuckit et al. (1978) note that 12 percent of hyperactive/antisocial drug abusers have abused stimulants, as compared with six percent of nonhyperactive drug abusers. As Schuckit et al. also note, their findings are neither dramatic nor consistent, and this particular one is not statistically significant. They also make a point similar to our own: that the hyperkinetic diagnosis is applied to a heterogeneous group of youngsters, many of whom are aggressive as well. To date, there are no findings linking hyperactivity, as such, with increased stimulant abuse.

COMBINATION-OF-EFFECTS THEORY *(p. 137)*

McAuliffe/Gordon

Researchers know far more about the recreational pattern, typified in street addicts, than about the medical-professional or iatrogenic pattern of addiction. The following account is addressed mainly, therefore, to explaining continuation of use within the euphoria-seeking pattern. It is expected that the other pattern would differ in important ways in view of the different kinds of persons involved in and differing goals of the two patterns.

Addiction to opiates begins to grow from the first reinforced doses, which are often the very first. Pooled data from various studies show that 65 percent of 717 addicts experienced euphoria to some degree on their first dose (Chein et al. 1964; Hendler and Stephens 1977; McAuliffe 1975a; Waldorf 1973; Willis 1969). Although nausea and vomiting often accompany the first dose, these reactions may be mixed with euphoria, or found not unpleasant by addicts-to-be, who learn from more experienced users that they are temporary (McAuliffe 1975a). Although continued unpleasant reactions cause some novices to give up use, for addicts the unpleasant effects usually disappear soon. After only a few doses, virtually all street addicts experience euphoric effects: 90 percent by the fifth dose in Waldorf's (1973) study of 422 addicts and practically 100 percent by the second dose in Hendler and Stephens' (1977) study of 30 addicts.

As with other reinforcers, the strength of the drug-taking response should increase most from the first reinforcement. Strong addiction does not develop from one dose, however, no matter how rewarding. More persons have used heroin, consequently, than have become strongly addicted (O'Donnell et al. 1976, pp. 13, 126). Lack of availability of heroin may therefore terminate use short of strong addiction, by allowing extinction to occur. (See Schasre 1966, table III.)

Extremely early heroin use is apparently maintained largely by peer group rewards derived from doing things with friends (e.g., Gordon 1967, p. 58; Hendler and Stephens 1977, p. 38; Howard and Borges 1970), but continued drug taking becomes increasingly a function of the drive produced by the effects of the drug itself. By the second dose the modal reason for use among neophytes studied by Hendler and Stephens (1977) had shifted from peer influence to enjoyment of the "high," and among heroin novices studied by O'Donnell et al. (1976, p. 67) 75 percent gave "to get high, or stoned" as their reason for use, compared to only 18 percent giving "because it was expected . . . in the situation." A study by Powell (1973) indicates that predependence heroin use occurs in sprees that seem to increase in length with duration of use.

Although peer group influences play a major role in the earliest stages of use, interest in the drug for its own effects soon begins to alter the composition of the peer group so that more time is spent with individuals who share that interest, and those who do not share it either drop their friendship or are dropped by the user (Hendler and Stephens 1977, pp. 35-37). Such alterations in social patterns are often well underway even before the more severe social disruptions brought about by the appearance of physical dependence, with its demands for steady access to supply and larger sums of money that draw the user more heavily than ever into close association with long-term addicts (Hughes and Crawford 1972). During this "honeymoon" period, methods of self-administration also shift toward those designed to yield more pleasure, from usually "snorting" to usually "mainlining" (Hendler and Stephens 1977, pp. 33-34). In many cases, occasional use continues for years before the psychological attachment to opiates becomes strong enough that daily use results (McAuliffe and Gordon 1974; Schasre 1966).

Daily use of heroin for a sufficient period of time at last introduces withdrawal sickness into the reinforcement picture. Physical dependence adds a potentially powerful source of negative reinforcement and introduces regularity to the addict's drive state by serving as a pacemaker for the lower bound frequency of use. Studies show that drugs that do not cause physical dependence (e.g., amphetamines) produce sporadic responding (Bejerot 1972, p. 12; Carey and Mandel 1968; Schuster and Thompson 1969, p. 489; Spealman 1979), whereas drugs that produce physical dependence (such as opiates) keep animals responding on a regular basis (Pickens et al. 1967). In early heroin use, the new pattern of avoiding withdrawal combines with the already existing recreational pattern of seeking the drug's positive effects.

In the long-term addict, euphoria, withdrawal sickness, and other miscellaneous reinforcing effects combine in various proportions to yield a complex schedule of reinforcement that sustains continued use (McAuliffe and Gordon 1974). The exact weighting of each effect in the reinforcement schedule may vary from time to time within a given individual and from addict to addict. At the time of injection, street addicts who are sick from withdrawal and who have only maintenance doses on hand are obviously satisfied to respond to just one component of their schedule (McAuliffe and Gordon 1974). With a larger supply, they typically respond to both components by reducing sickness and enjoying euphoric effects, too. Oftentimes, having done so, they will take another dose soon afterward, to produce even more intense euphoria. Having already attended to withdrawal needs, this time the response is solely to the euphoric component. The weighting of these components across contemporary addicts ranges from one extreme, exemplified by rare addicts who almost never experience euphoria, to the other, exemplified by rare addicts we have interviewed who get high on virtually every injection. At any given time, most street addicts are distributed in intermediate positions, where they avoid withdrawal and receive intermittent positive rewards. Quite different combinations may be typical of medical-professional addicts, iatrogenic addicts, soldiers addicted in Vietnam (Gordon 1979), and so on. It is the history of reinforcement gained from using drugs in all of these ways that accounts for an individual's overall drug-derived motivation for opiate use.

COPING THEORY *(p. 38)*

Milkman/Frosch

The ready availability of a wide range of psychoactive agents provides the user with the freedom to select, with some degree of accuracy, a specifically altered ego state with known physical and psychological properties. Although initiation of use of a particular substance may be circumstantially determined, continued use or rapid cessation is related to the individual's unique psychophysical reaction to the drug.

The motivation toward continued involvement is the integrated result of constitutional, social/environmental, and intrapsychic factors. Disturbances in the normally expected mastery of phase-specific conflicts in early childhood are hypothesized to result in defective ego functioning in the substance-prone individual. The overly stressed characteristic defense mechanisms of the defective ego are temporarily bolstered through pharmacologic support. If a particular drug-induced ego state provides a mechanism for easing the discomfort of conflict, an individual may seek out that particular drug when that conflict is reexperienced. The reinforcing quality of temporary stress reduction leads to continued reliance and utilization. The drug of choice will be the pharmacologic agent which proves harmonious with the user's characteristic mode of reducing anxiety. Furthermore, the selected drug appears to produce an altered ego state which is reminiscent of and may recapture specific phases of early child development, e.g., heroin, first year; amphetamine, second to third year.

ADDICTIVE EXPERIENCES THEORY *(p. 142)*

Peele

Persons use drugs, simply speaking, when they find such use to be rewarding in terms of values, needs, and overall life structure. Conceivably a drug can fulfill positive functions for an individual--such as enabling him or her to work better or to relate to others. Even in this case there is the danger that functioning in a positive sense will become dependent on continued drug use. In all cases, use of the drug will probably make it harder for the person to eliminate underlying and unresolved problems.

While the experience the drug produces for the person must provide rewards for him or her in order to maintain drug use, this is not to say that its objective impact on the user's life will not be negative. Thus narcotic or barbiturate users find the removal of pain and the absence of anxiety induced by the drug to be rewarding, even though these effects make them less sensitive to and less effective in dealing with their environment. In fact, it is this very depletion of capabilities which best guarantees continued use of the drug.

Consider the stimulant addict, such as the addicted coffee drinker, who uses caffeine to provide energy throughout the day. By masking fatigue, inadequate nutritional input, lack of exercise, etc., and all those deficiencies which force reliance on the caffeine, the drug makes the person less aware of the need to change his or her habits so as to be able to supply energy needs naturally. In this way, the caffeine perpetuates its own use.

SOCIAL NEUROBIOLOGICAL THEORY *(p. 286)*

Prescott

The continuation of substance usage is dependent, in part, upon the continuation of somatosensory affectional deprivation and the need to maintain friendships and social positions where those friendships and social positions are contingent upon the use of drugs or alcohol. Support for the continuing use of drugs is facilitated by the practices of modern medicine and the advertising practices of the pharmaceutical corporations. Social learning processes which operate at all levels of development (childhood to adulthood) capitalize upon the need for the body to find relief from tension and pain created in large part by somatosensory affectional deprivation. Societal and moral values that are intrinsically opposed to somatosensory pleasure and sexual pleasure, in particular, provide support for the alternatives of drugs and alcohol. Societal opposition to massage parlors and prostitution but open acceptance and support of the alcohol industries is a case in point. Societal acceptance of addicting drugs that impair somatosensory pleasure, e.g., alcohol and methadone, and opposition to drugs that facilitate pleasure, e.g., marijuana and heroin, is another case in point. Carstairs' (1966) classic study should be consulted in this context as a dramatic illustration of the reciprocal inhibitory relationships between drug use and behaviors that are culturally determined. Carstairs reported on the use of bhang (marijuana) and alcohol in the two highest caste groups, Rajput and Brahmin, in a village in northern India. The Rajput, the warrior class, indulged in alcohol, which facilitated the expression of sexuality and violence. The Brahmin was the religious class and indulged in bhang, which facilitated religious experiences and enhanced their spiritual life. The holy men avoided alcohol, which they considered destructive to salvation, and would not permit a Hindu who had consumed alcohol to "enter one of his temples (not even a goddess temple) without first having a purgatory bath and change of clothes" (p. 105).

The continuation of use or abuse and the choice of drug are culturally influenced. A culture will support the use of certain drugs that are consistent with and supportive of its own mores and values and will oppose the use of those drugs that interfere with these mores and values. Thus, the U.S. culture, which is predominantly an extroverted, violent, and exploitive culture (sexually and economically), supports the use of alcohol, which facilitates these behaviors. Conversely, the U.S. culture opposes the "pleasure" drugs (marijuana and heroin), which inhibit violence and exploitation and facilitate introspective and contemplative behaviors. (This statement should not be construed as supporting drug use for recreational purposes.) The issue is not whether a drug is addicting or nonaddicting--alcohol is addicting (culturally supported) and marijuana is nonaddicting (culturally opposed); heroin is addicting (culturally opposed) and methadone is addicting (culturally supported). Both the fabric and the loom of culture must be understood if the choice of specific drugs and the continuation of use and abuse are to be understood.

GENETIC THEORY *(p. 297)*

Schuckit

Once someone does try a drug, the decision to continue using the substance probably involves a combination of social and biological factors. While genetically mediated reactions to the drug may play a larger role here than in the initiation of use, social factors still hold great influence.

Genetically influenced biological factors may be important in the balance of pleasant and unpleasant effects seen with almost all substances on their first try. Constitutional factors may determine the incidence and severity of adverse problems, such as coughing, nausea, or vomiting, and may mediate the intensity of pleasant effects as well. Thus, the individual's personality, usual level of anxiety, the mechanisms and rate of metabolism of the substance, and the nervous system's sensitivity to the substance may all contribute to the final balance between the positive and negative effects of the first ingestion and in this way contribute to the individual's decision to try the substance again.

It also seems apparent from individual histories of smoking or opiate use, for example, that there are a variety of social and psychological factors which interact with the biological reactions. These would include peer pressures, the desire to assume an adult role and the need to copy parental models, and general societal values about the drug (e.g., alcohol and marijuana) which may influence an individual to try the drug on repeated occasions despite the early adverse consequences of taking the substance. With each repeated use, there may be a tendency for the more positive aspects of drug effects to predominate as "tolerance" develops to the negative consequences of the drug. This may make repeated use more and more likely.

AVAILABILITY AND PRONENESS THEORY *(p. 46)*

Smart

Most users of illicit drugs do not continue their use to the point of addiction. A more common event is that the user tries the drug a few times, has his or her curiosity satisfied or finds the drug unrewarding and discontinues its use. Those who continue drug use to become daily or addicted users will display an unusually high level of proneness in terms of social or psychological needs. Proneness is likely to be a more important factor in continuing use than is availability. Since the first use has already taken place, the user has overcome the major difficulties in obtaining drugs. The user will know peers, siblings, or associates who are users and hence have some reasonable access to the drug. Those who experience especially great frustrations with ghetto life or who have major psychological problems will be more likely to continue use. As use continues, the user gains more access to drugs, and physical availability becomes less a problem than it is for new users or nonusers. However, for daily users of expensive drugs, a limit on their availability is set by economic costs. Users must increase their income by either legitimate or, more likely, nonlegitimate means in order to maintain their access to drugs at high levels of usage.

PERCEIVED EFFECTS THEORY *(p. 50)*

Smith

Any single act produces numerous and varied positive and negative consequences for the actor. Some will be recognized by the actor; some will not. Those that are recognized will be accorded differential importance. The aggregate of this mix of perceived consequences determines the likelihood that the act will be repeated. Substance use will continue as long as the aggregate benefits are perceived as being greater, or more valued, than the aggregate costs. The cost-benefit relationship depends on many variables, such as which substance is used, its strength, the frequency of its use, the immediacy and intensity of its perceived effects, the needs the substance is perceived as satisfying and frustrating, the intensity of those needs, their importance and centrality in the user's life; and the effects use has on the user's concepts of Self and Ideal Self.

The match of the perceived drug-induced changes and the perceived needs of the user is important in determining whether or not use will continue. The individual who places high value on feeling strong, alert, decisive, and masterful is apt to find amphetamine or cocaine much more satisfying than a person who emphasizes peace, physical relaxation, and the contemplation of philosophical and metaphysical issues. A person of the latter type would probably find drugs like marijuana and LSD far more enjoyable. The better the match between the perceived substance effects and the user's needs, the more likely use is to continue.

The mood and cognitive changes caused by use of certain substances can temporarily alter the user's concepts of Self and Ideal Self. If use reduces the discrepancy between the user's perceptions of Self and Ideal Self, continuation of use is likely--even if those changes last only as long as the drug effect itself.

Whatever the substance, its use is likely to continue as long as the amount and pattern of use are perceived by the user as providing a net aggregate benefit, whether by physical or psychological gratification, reduction of physical or psychological distress, alteration of the user's perception of Self or Ideal Self, perceived enhancement of performance, or some other mechanism.

LIFE-THEME THEORY *(p. 59)*

Spotts/Shontz

After a period of experimentation with many substances (usually in the company of friends) the person who becomes a heavy, chronic user chooses the single drug or class of drugs which most nearly produces the ego state that is needed to patch over the problem on the ego/psyche axis. Another factor determining final choice is regular access to the desired substance. Some persons will settle on a drug that is second best, from a personal point of view (e.g., amphetamine), because they cannot obtain or afford the one they really want (cocaine). Once a drug that produces the desired ego state has been found, and once sources of supply have been established, social support for continuation of its use is no longer required. The person-drug relationship becomes self-sustaining.

FAMILY THEORY *(p. 147)*

Stanton

When drug use, especially heavy use, is continued for a prolonged period, it is helpful to view it as indicative that the user and the user's family have gotten stuck at some point in the family life cycle. They have hit a developmental milestone and cannot get past it, slipping into a repetitive behavioral pattern. In addition to the turmoil of adolescence, a variety of extrafamilial factors can threaten the family system and trigger a cycle of continued use in one or more members. These factors might include the father losing his job or facing retirement, a family member becoming seriously ill, the death of an important member, or a sibling marrying or leaving home. Social systems outside the family, including peers (Wikler 1973b), social agencies, and legal institutions, can affect the drug user directly, and through the user, the family. However, without denying the importance of extrafamilial systems, the family's influence should be considered the primary one in most cases of continued use, since the family accentuates or attenuates the impact of these external influences.

Drug abusers are locked on the horns of a dilemma. On the one hand, they are under great pressure to remain intensely involved in the family to keep it intact, while on the other, sociocultural and psychobiological forces dictate the establishment of intimate outside relationships. Continued heavy drug use is the unique paradoxical solution to the dilemma of maintaining or dissolving the triadic interaction. On the systems level, the drug use cycle serves to give the appearance of dramatic movement within the family as the triad is dissolved, re-established, dissolved, and re-established again. In addition, drug abusers become involved in a homeostatic pattern of shuttling back and forth between peers and home. An interpersonal analysis of the system reveals, however, that abusers form relationships within the drug culture which effectively reinforce their dependence on the family. Again, the outside relationships can be considered as the arena for pseudo-independent and pseudo-competent behavior, while paradoxically, the greater the involvement with the peer group, the more the abuser becomes helpless, i.e., addicted. This helplessness is redefined by the family in a dependency-engendering way, i.e., as a "sickness," and is therefore acceptable.

SELF-ESTEEM THEORY *(p. 157)*

Steffenhagen

Low self-esteem provides the basis for continuation of drug use since such use could be a coping mechanism for the protection of the "self." Individuals with inferiority feelings marked by inadequate interpersonal relations are prime targets because they use drugs as a way of relating to each other; drugs are the bond for camaraderie, the cultural item around which the group revolves. In this instance, the behavior defeats the very purpose for which it was intended because their already fragile contact with reality will be further impaired by the drug. Drug use could move quickly toward drug abuse, and the individual could then say, "See, if it weren't for the fact that I am physically addicted to heroin, I would be able to get a job and make a success of myself."

CYCLICAL PROCESS THEORY *(p. 164)*

van Dijk

In explaining the continuation or maintenance of drug use, four types of vicious circles or cycles in the addiction process are delineated: (a) pharmacological, (b) cerebro-ego-weakening, (c) social, and (d) psychic. Pharmacologically, the use of a drug creates metabolic changes (tolerance, withdrawal syndrome) which, in turn, increase the individual's need for, and use of, the drug. Cerebro-ego-weakening means that the use of a drug may interfere with or alter the individual's cerebral functions which regulate use. Ultimately, the ego is weakened, and, in turn, the resistance against the motivation for drug use is decreased; consequently, drug use escalates. The social vicious cycle depicts the use of drugs as leading to negative social consequences (reproaches of family, friends, employers). Slowly, the individual adopts the social role of being an addict and experiences some reinforcement as a result of identification with the drug-using subculture. Such identification, in turn, fosters continued drug use. Finally, the psychic cycle is characterized by increased feelings of guilt and shame, regressive and infantomimetic behaviors, and predominance of the pleasure principle. These feelings and effects ultimately increase the need for more drugs (in the hope that the drug will decrease these feelings) and the cycle becomes complete. Given the force of these vicious cycles, the prospects for cessation of use are minimal, unless the cycles can be short-circuited, perhaps with methadone as a drug substitute.

CONDITIONING THEORY *(p. 174)*

Wikler

The pharmacological effects of heroin (miosis, respiratory depression, analgesia, etc.) are conceived as reflex responses to the receptor actions of the drug, but its "direct" reinforcing properties are ascribed to acceptance by the peer groups and reduction of hypophoria and anxiety. With repetition of self-administration of heroin, tolerance develops rapidly to the direct pharmacological effects of the drug and physical dependence begins (demonstrable by administration of narcotic antagonists after only a few doses of morphine, heroin, or methadone; see Wikler et al. 1953). The prevailing mood of the heroin user is now predominantly dysphoric, and withholding of heroin now has as its reflex consequence the appearance of signs of heroin abstinence (mydriasis, hyperpnea, hyperalgesia, etc.), which generate a new need, experienced as abstinence distress. Because of previous reinforcement of heroin self-administration, the heroin user engages in "hustling" for opioids--i.e., seeking "connections," earning or stealing money, attempting to outwit the law--which eventually becomes self-reinforcing, though initially at least, it is maintained by acquiring heroin for self-administration. In this stage, the "indirect" reinforcing properties of heroin are attributed to its efficacy in suppressing abstinence distress. "On the street," the heroin user who is both tolerant and physically dependent frequently undergoes abstinence phenomena before he is able to obtain and self-administer the next dose. Given certain more or less constant exteroceptive stimuli (street associates, neighborhood characteristics, "strung out" addicts or leaders, "dope" talk) that are temporally contiguous with such episodes, the cycle of heroin abstinence and its termination can become classically conditioned to such stimuli, while heroin-seeking behavior is operantly conditioned.

DEFENSE-STRUCTURE THEORY *(p. 71)*

Wurmser

The same circle of specificity (depicted in figure 1) as was mentioned in regard to initiation is actualized in continued drug use. There is also, as with all neurotic phenomena, a process of spreading and generalizing. For more and more "narcissistic crises," anxiety situations, and dysphoric affects relief is sought in form of this self-treatment. It becomes a "cure" for all ills. Its pleasure is used as a more and more global defense against all the unhappiness derived from the primary pathology. It is part of the secondary defensive struggle known in all nosologic entities in psychiatry (Freud 1926).

Transition: Use to Abuse

PERSONALITY-DEFICIENCY THEORY *(p. 4)*

Ausubel

The distinction between narcotic use and abuse is analogous to the distinction between marijuana use and abuse, i.e., the difference between casual, sporadic, or recreational users, on the one hand, and those who are almost permanently "stoned" or narcotized as a style of life on the other. Narcotics, by virtue of their more potent euphoric effects, obviously lend themselves more easily than does marijuana to chronic abuse.

Theories hypothesizing that heroin use at a certain critical level leads to a state of intracellular "tissue hunger" that is satisfied by continuous administration of a stabilized dose of methadone are unable to explain adequately why many MMTP patients still seek euphoria from "doubling up," foregoing their methadone before shooting heroin and overindulging in alcohol, barbiturates, amitriptyline, and the benzodiazepines.[1] If heroin addiction were caused by "tissue hunger" to begin with, and then relieved by stabilized doses of methadone, why should one seek this surreptitious form of euphoria from heroin and other drugs that jeopardizes one's status in MMTP programs? A more parsimonious explanation, therefore, is that they relapse to drug use because of the very same reasons that cause their addiction in the first place, i.e., various forms of personality predispositions, reassociation with addicts when they return from isolated treatment centers to their old neighborhoods, the accessibility of drugs in their environment, community attitudinal tolerance for the practice, and insufficient character reeducation during "treatment" to withstand the blandishments of heroin-induced euphoria.

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[1] Evaluation studies of MMTPs (e.g., Gearing 1971), which treat urine samples as if they were authentic and reliable research evaluation material are misleading. In most MMTPs, urine samples are not randomized or supervised, and the more expensive tests for the benzodiazepines are usually not performed. For other methodological deficiencies of many of the evaluation studies that grossly overestimate the retention and success rates of methadone maintenance treatment programs, see Lukoff (1974, 1975).

Theories of addiction that explain the transition between drug use and abuse (e.g., Becker 1953; Lindesmith 1947) on the grounds that addicts become habituated to a substance when they perceive the relationship between continued use and relief of distress beg the significant question of differential susceptibility.

ADDICTION-TO-PLEASURE THEORY *(p. 246)*

Bejerot

When the pleasure stimulation becomes strong enough (either through a few intensive positive experiences or from many less intensely appreciated), there occurs a learned conditioning to the intoxication experience, probably when new and shorter nerve courses come into function and higher centers are disconnected. The process should accelerate if other sources of pleasure are neglected or for other reasons have become less interesting (sexuality for opiate abusers, etc.).

DISRUPTIVE ENVIRONMENT THEORY *(p. 76)*

Chein

Not all of the youngsters who experiment with drugs, or even all of those who become habitual users, become addicts. Many of them, as they get older, mature sufficiently to become interested in finding a job or a steady girlfriend, and if they are successful they no longer need drugs. Some find that drugs do little for them, and so they give them up. Not all people react to opiates in the same way. The addiction-prone youngster apparently reacts to the drug in an especially intense manner. The more severe his personality disturbances are, the more likely he is to become addicted. The lack of a cohesive and supportive family is probably the determining factor in the transition from use to addiction.

INCOMPLETE MOURNING THEORY *(p. 83)*

Coleman

The shift from drug use to misuse (i.e., abuse) depends on the extent of dysfunction within the family. Recently Olson et al. (1979) developed a circumplex model to identify 16 types of marital and family systems. The circumplex model is based on the concepts of family cohesion and family adaptability and has been used for both diagnosis and treatment. The authors define family cohesion as "the emotional bonding members have with one another and the degree of individual autonomy a person experiences in the family system." A high extreme of cohesion is "enmeshment," which is an overidentification with the family, resulting in extreme bonding and limited individual autonomy. "Disengagement" is the low extreme and consists of low bonding and high autonomy from the family. Olson et al. hypothesize that a balanced degree of family cohesion is necessary for effective family functioning and individual development.

The second dimension of the circumplex model is adaptability, which is defined as "the ability of a marital/family system to change its power structure, role relationships and relationship rules in response to situational and developmental stress." Both morphogenesis (change) and morphostasis (stability) must necessarily be balanced in an adaptive system.

The circumplex model describes 16 possible types of marital and family systems with accompanying labels or descriptive terms relative to the level of adaptability and cohesion. These terms are used to describe the underlying dynamics of the marital/family system. The four types in the center of the circle represent balanced levels of adaptability and cohesion and are considered as most functional to individual and family development. The four types in the extreme area of the circle reflect very high or low levels of adaptability and cohesion and are viewed as most dysfunctional to individual and family development. In an effort to avoid the unidimensionality of many classification systems, which assume a linear relationship from one end of the continuum to the other, the circumplex model is dynamic and permits movement in any direction.

Although only four drug-dependent families were diagnosed according to the circumplex model, they were all found to have extreme scores on both the adaptability and cohesion dimensions. The systems were very different despite the commonality of the presenting problems and the similarity of the extreme scores. This suggests that extreme scores might be characteristic of families in which drugs are abused, i.e., more dysfunctional, whereas families that are experiencing casual drug use could be placed closer to the central region of the circle, i.e., more functional. Within the context of the incomplete loss theory, the degree of pathology in family interactions might account for drug use becoming an abusive or addictive problem. It is suggested that many subtle factors accompany the loss experience, thus accounting for variations between families. Although they may have similar etiological components, the intervening family actions and reactions could clearly account for different response patterns. Certainly Eisenstadt's (1978) concept of creative bereavement is supportive of this premise. It is assumed that Eisenstadt's eminent subjects were able to master their loss because their family systems were closer to optimal with regard to their cohesiveness and adaptability, placing them in a more central part of the circumplex model.

LEARNED BEHAVIOR THEORY *(p. 191)*

Frederick

In the transition from use to abuse, the most likely factor involved is one of risk taking (Rd). Within a given personality, if motivation and habits remain relatively constant, then merely an alteration in risk-taking behavior in a negative direction will be enough to tip the scales toward drug abuse. Since the drug habit has already been formed by repeated use, it appears probable that seeking a more dramatic form of tension reduction becomes necessary. Seeking a "new high" or some other form of escape from the anxieties of the day would account for the increase in risk-taking behavior. The likelihood of drug-seeking activities mounts when the environment or cultural associations are such that it becomes easy for the individual to engage in drug abuse. This is particularly prevalent in the milieu of the so-called drug culture, yet this phenomenon can occur in far more banal settings of everyday life. The fact that our modern society has become oriented toward the acceptance of drug ingestion sets the stage for easy learning of drug abuse later. Children who mimic parents often request pleasant-tasting aspirin for headaches, having witnessed the taking of many tranquilizers, analgesics, and soporifics by their mothers, fathers, and other adults. Needless to say, emulating the behavior of older teenagers is a part of peer-group pressure, which young people find increasingly difficult to resist. Teenagers, of course, do not constitute the only high-risk group on the current scene. A menopausal woman, for example, can accomplish the same thing by obtaining prescriptions from a variety of physicians with whom she makes contact. Substituting the numerical values shown in the basic formula will illustrate the point.

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{2 \times 3 \times 1 \times 6}{3 \times 4 \times 1 \times 5} = \frac{36}{60} = 0.60$$

COGNITIVE CONTROL THEORY *(p. 8)*

Gold

The move from drug use to abuse or addiction is seen as an intensification of the processes involved in the individual's move from experimentation to regular usage. The individual who is abusing drugs is now unable to cope with anxiety and conflict without the drug. Drugs have become the only way abusers can feel good about themselves, cope with anxiety, and feel in control. The stage of addiction is reached because of a vicious cycle established by continued use. As drug users rely more and more on drugs for feeling good and in control, they repeatedly confirm their belief that they are powerless to cope on their own. Each failure to function without drugs strengthens the belief that drug-free coping is impossible. The vicious cycle is complete when the drug abuser is convinced that these fears are true; the addict is powerless to cope with the environment without drugs.

MULTIPLE MODELS THEORY *(p. 18)*

Gorsuch

With continued drug use at a fairly heavy level, one or both of two additional processes may occur. First, if drugs such as heroin are used on a daily basis then physical addiction can occur, with the complicating factor of withdrawal problems. Second, there are those individuals who have trivial withdrawal symptoms or who use a nonaddicting drug but who nevertheless have made the drug a focal point of their lives. These individuals are considered psychologically dependent.

In the areas of psychological dependence and physiological addiction, there is little research because of difficulties inherent in examining the phenomena. Retrospective reports of the more important variables are open to subjective distortion and forgetting, so interviewing a group of those who have been addicted or dependent sufficiently long to be sure the condition exists provides little useful information on many matters of importance. In comparing both psychological and physiological addicts with others, one suffers from the problem of not knowing what is a cause of the addiction and what is a result of the addiction. The best research design, the longitudinal study, suffers from the fact that few individuals in the populations most readily accessible for longitudinal studies become addicts. For example, it would take a study involving thousands of college freshmen to obtain a sufficient sample for research purposes of college seniors who could be defined as addicts. Futhermore, although the phenomenon of addiction is apparent among long-term users, definitions which separate the continued drug user from the addict are difficult to develop for research purposes.

Physiological addiction is associated with a major shift away from models describing an initial drug experience. Whether the individual's path was through nonsocialization, prodrug socialization, or iatrogenic use is no longer relevant. The primary feature now is satisfaction of the physiological need and prevention of withdrawal symptoms.

The limited research that has been done on psychological dependence indicates that it may stem from the "rush" experience or from the social reinforcement found in prodrug subcultures, where a person may develop a distinctive role for relating to others based upon the drug orientation. In addition, the research on aversive conditioning suggests that the individual who finds that taking an illicit drug prevents a negative experience (such as physical pain or anguish) from occurring may develop a particularly strong dependence which is extremely resistant to change even after the logical possibility of the negative experience becomes slight.

Psychological and physiological addiction are not mutually exclusive. While psychological dependence may well occur without physical addiction, they may also appear together and reinforce each other.

EXISTENTIAL THEORY *(p. 24)*

Greaves

According to Greaves' existential theory, some individuals are highly susceptible to drug dependency. These are primarily individuals who are dysphoric and who, by virtue of adverse patterns of personality development, have not learned to generate euphoria or to access altered states of consciousness in more normal and less destructive ways.

The more severe the personality disturbance, the lower the threshold of abuse. Thus, severely disturbed users of drugs will abuse drugs despite strong peer and social disapproval and despite major negative sanctions. Less severely disturbed individuals may be led to abuse drugs with sufficient peer support, but are malleable in their use patterns depending on their environment.

With normal individuals the drug abuse threshold is high and any peer-stimulated or automedication abuse tends to be situational and transient, as continued abuse tends to interfere with normal adaptive and functional processes. In other words, healthy people cannot be consistently persuaded by other individuals or events to behave in need-frustrating ways.

Thus, the drug abuse threshold can be defined as an interaction between an individual's personality state (healthy versus unhealthy), social factors (support versus dissuasion), and transient intervening events (crises versus stable states).

ADAPTATIONAL THEORY *(p. 195)*

Hendin

The shift to abuse usually is a sign that the pressures of conflicts instigating the use are so great that larger doses of the drug are needed while the relief given by the drug is now being counteracted by the psychological, physiological, and social complications that result from its use. For example, young women who hate school but feel the need to comply with parental wishes for achievement may do so with the aid of massive doses of amphetamines. At some point, however, the amphetamine toxicity often causes them virtually to cease functioning, and in the worst cases causes a transient psychosis.

Abuse usually indicates that the drug is not helping the user in even marginal attempts to deal with problems. At this point it can become a way of abandoning these efforts. A man may take a few drinks to ease his anxiety with a woman; he gets drunk to avoid having to deal with her or with his anxiety. A student may use marijuana to ease the competitive struggle of academic life; he or she may become a "pot head" when the struggle becomes overwhelming (Hendin 1973a, 1975).

Something of a dividing line exists between drug abusers who will use drugs orally and those who will also inject them intravenously. Young people who are almost perpetually stoned may be nevertheless shocked at the idea of using drugs intravenously. Youngsters willing to do so are usually less self-protective, more reckless, and more self-destructive than those who will not. Frequently their attitude toward life is that they do not have much to lose. The initiation into intravenous use is therefore a critical variable suggestive of serious adaptive failure (Hendin 1974a, 1975).

Most adolescents fluctuate in the intensity of their drug abuse. During periods of less use, they tend to gravitate to friends who are not drug abusers. During periods of their greatest abuse of drugs, their relationships with other drug abusers become more significant to them. Thus peer relationships seem to support the youngster's immediate adaptive needs rather than to cause them (Pittel et al. 1971).

SOCIAL DEVIANCE THEORY *(p. 90)*

Hill

Some of the conditions necessary for transition from occasional drug use to abuse have been mentioned in part I. Their "direct" reinforcing properties are ascribed to acceptance by the peer group and reduction of hypophoria, anxiety, and pains after tolerance and withdrawal occur. Wikler's principles (1953) of conditioning will almost surely be found to be operative, and some factors at which we now only speculate will emerge.

Only in the last decade, 1970-1980, has a serious second look been taken at the role psychopathic and sociopathic characteristics may play in opiate and alcohol addiction and in criminality. The strong evidence recently reported by Martin et al. (1977) is one example of further psychological and physiological differences between opiate addicts, institutionalized alcoholics, prisoners, and the normal population.

BIOLOGICAL RHYTHM THEORY *(p. 262)*

Hochhauser

If the drug(s) is effective in controlling the chronobiological rhythms or in generating perceptions of psychological control, the use may shift from a pattern of use to abuse. Since the drug use itself may interfere with chronobiological processes (e.g., sleep patterns), the individual may develop a vicious cycle behavior of using drugs to control rhythms, which are then disrupted by the drugs, which leads to more drug use, and so on. For the user/abuser, one perceived positive aspect of drug dependence may be an initial feeling of control--regular drug use may provide a relatively high degree of predictability and controllability. The addict in the early stage of addiction may have a high degree of internal control, especially if narcotic use is effectively reducing levels of physical and/or psychological pain.

DRUG SUBCULTURES THEORY *(p. 110)*

Johnson

A theme of the theory developed by Johnson (1973) involves the importance of drug selling within and between drug subcultures. (Also see Single and Kandel 1978.) The reciprocity conduct norms shift to distributional conduct norms when individuals begin to provide or sell more drugs than they receive or buy for their own use. The distribution conduct norms change even more dramatically when the individual expects close friends to pay cash for the drugs they receive. An individual attains the role of "dealer" within the subculture when (a) sales are made to persons other than close friends, (b) sales are large enough to provide the person and/or close friends with "free" drugs, or (c) the net income from sales becomes a substantial portion of total income.

A major indicator of what social-control authorities refer to as drug abuse (although drug-subculture theory avoids this term) is the frequency and amount of drugs dealt. Escalation from casual transfers of marijuana between friends to the purchase and subsequent sale of a pound or more of marijuana and mid-level sales of other drugs shifts the user/seller into a fundamentally different role in drug subculture. The dealer's role is central to the drug subculture in several respects (Langer 1977). Mid-level dealers assure the availability of drugs to less frequent users; without dealers, supplies of drugs would be cut off to the average user (indirectly or directly). Dealers are respected because they take the risk of committing a felony for which a stiff prison sentence could be imposed. Users know that the dealer must pick friends and buyers carefully to avoid arrest. Dealing is frequently a means of supporting the consumption of more drugs (both in quantity and frequency) than most nondealers use. Many dealers also obtain a majority of income from such activity. Dealers generally are very likely to exhibit the most extreme patterns of drug-related behaviors; they also symbolize or teach innovative behaviors to those peer groups and individuals to whom they sell (Carey 1968; Preble and Casey 1969; Johnson 1973; Blum and Associates 1972a; Langer 1977; Waldorf et al. 1977; Johnson and Preble 1978; Smith and Stephens 1976). Dealers frequently use large quantities of drugs for relatively little or no cash expenditure, and a high proportion exhibit other nonconventional behaviors (crime, poor performance in legitimate roles). Thus, dealers are very likely (Waldorf et al. 1977; Johnson 1973; Single and Kandel 1978) to be the heaviest drug abusers. These same behaviors, however, are widely respected, envied, and important to drug-subculture participants and to the continued maintenance of subcultural values and conduct norms (Waldorf et al. 1977; Feldman et al. 1979).

EGO/SELF THEORY *(p. 29)*

Khantzian

The addiction-prone individuals' ego and self disturbances predispose them to dependence on drugs, given the general and specific appeal of drugs. Given this appeal, there is a natural tendency in such individuals to use heavier and heavier amounts, resulting in physiological dependence on one's drug or drugs of choice. However, I also believe there is a psychological basis to depend increasingly on drugs. I have concluded that heavy drug use and dependence predispose persons to progression in their drug-use patterns, with a tendency to preclude the development of more ordinary human solutions to life's problems. In repeatedly resorting to a drug to obtain a desired effect, the individual becomes less and less apt to come upon other responses and solutions in coping with internal life and the external world. It is in this respect that an addiction takes on a life of its own. Consequently there is an ever-increasing tendency for regression and withdrawal which is further compounded by society's inclination to consider such behavior as deviant and unacceptable. Regressed and withdrawn individuals discover that in the absence of other adaptive mechanisms the distressing aspects of their condition can be relieved only by either increasing the use of this preferred drug or switching to other drugs to overcome the painful and disabling side effects of the original drug of dependence (Khantzian 1975).

GENERAL ADDICTION THEORY *(p. 34)*

Lindesmith

Since the theory places the source of craving in the experience of relieving withdrawal distress, it is centered on this stage--the shift from use to abuse (addiction). In order for this effect to occur, it is necessary that the user correctly identify and understand this distress. Prior to this point of no return, she or he may have been totally unaware of the identity of the drug and of becoming physically dependent on it; indeed, the user could have been unconscious during this entire preliminary period. But if the user recovered consciousness just before the drug was withdrawn, she or he could still become an addict if the whole situation was explained and if allowed to use drugs to cure the withdrawal distress that was being experienced and understood for the first time. It should be noted that addiction produced in medical practice by the administration of morphine to a patient with a chronic, painful disease, such as terminal cancer, ordinarily involves no self-administration of the drug. This form of addiction should probably not be identified as "drug abuse."

As implied by the theory, users' first experiences with withdrawal in a fairly severe form are sometimes sufficient to start a cognitive revolution in their minds as they begin to restructure their conceptions of the drug habit, of drug addicts and of themselves. As the craving grows and expands with continued use, they first begin to fear and then to admit that they are junkies just like the other junkies they know.

HYPERACTIVE ADOLESCENTS THEORY *(p. 132)*

Loney

Diagnosis and drug treatment of the hyperkinetic/minimal brain dysfunction syndrome were not widespread until the sixties (Clements and Peters 1962; American Psychiatric Association 1968; Laufer and Denhoff 1957), and adolescent followup studies of treated hyperkinetic children did not begin to appear until the seventies (Laufer 1971; Mendelson et al. 1971; Weiss et al. 1971). The majority of adults who were diagnosed and treated for childhood hyperactivity are still in their early twenties; and longitudinal studies of the precursors of drug use are only recently being undertaken, even with normal samples (Kandel 1978b). Thus, the attention of most investigators is still focused on attitudes and initial experimentation, rather than on clear-cut abuse, and on alcohol and marijuana rather than on opiates (Kandel 1975). Even among at-risk populations, abuse is relatively infrequent during early adolescence. Because stimulant drugs have been the medication of choice for hyperactive children, the major fear has been of subsequent stimulant abuse due to treatment-produced changes in the children's attitudes towards drugs. Therefore, it has seemed wise to study at-risk samples drawn from young, rural populations, who are known to prefer marijuana and stimulants. At the same time, the infrequency of opiate abuse among rural hyperactive individuals may ultimately preclude effective statistical inference at any age.

Considerable fear has also been expressed that hyperkinetic children will become "hooked" on their medication and continue it on their own. It has been assumed that such an addiction would be accompanied by the usual signs of dependency: euphoria, tolerance, withdrawal, etc. Such signs have seldom been reported. Our own subjects described a panoramic assortment of reactions to medication. Most were "calmed," but a few were rendered oblivious and immobile, while a few became "wound up" and high. These more dramatic effects may be dose related. Few of our subjects seemed to like the calmness that the medication produced; instead, they seemed to realize and eventually to value the fact that medication kept them out of trouble. In effect, the medication kept their parents and teachers calm as well. Less than five percent of the boys described positive mood reactions, and virtually all of those also had marked aggressive symptoms. Goyer et al. (1979) have presented a case study of an adolescent boy with an apparently addictive reaction to treatment with a CNS stimulant; that boy was clearly aggressive and antisocial as well as hyperactive.

COMBINATION-OF-EFFECTS THEORY *(p. 137)*

McAuliffe/Gordon

In common parlance, persons are said to be "addicted" when they have become physically dependent or at least seem unable to refrain from using a drug. We regard these events as merely signalling that a sufficient history of reinforcement has probably been acquired to impel a high rate of use. In the case of strong physical dependence, the user is confronted with the necessity of responding at a minimal rate (which happens to be also a high rate) if immediate use for whatever reason is to continue at all and if a negative reinforcer is to be successfully avoided. In our theory, there is no single point at which an individual suddenly becomes "addicted." Instead, the individual's addiction develops insidiously and varies continuously, so that what others seemingly mean when they label someone an "addict" is merely a person with a strong addiction (i.e., a history of reinforced drug taking sufficient to outweigh the more acceptable reinforcers of life, such as are associated with one's job, family, friends, sex life, and respectability).

Physical dependence on opiates is neither a necessary nor a sufficient condition for the development of addiction. Physical dependence simply sets the stage for experiencing withdrawal distress, reduction of which constitutes one of the drug's powerful reinforcing effects. Other effects (principally euphoria, but including secondary social gains, and relief of pain, anxiety, and fatigue) can themselves produce or contribute to addiction. Most, if not all, street addicts are reinforced in the early stages of heroin use by effects other than withdrawal, and their drug-taking response at that stage must be strong enough so that it occurs every day for a few weeks in order for them to develop physical dependence. Since contemporary opiate abusers know about physical dependence and usually prefer to avoid it, their daily use prior to dependence must reflect the existence of an addiction of some strength. We have interviewed heroin users who had never been dependent but who were either adamant about wanting to continue heroin use despite the risks and severe social pressures or convinced that they could not stop even though they wanted to. We and other researchers (Lindesmith 1947; Robins 1974a) have also interviewed persons who have used opiates compulsively on a daily basis for many months without ever interrupting long enough to experience withdrawal sickness.

The distinction between addiction and physical dependence is also evident in detoxified addicts who are temporarily free of dependence but who are still strongly addicted, as witnessed by their expressed desire for opiates and their disposition to relapse, and in those medical patients who become physiologically dependent without knowing it but who remain indifferent because they have not developed a strong psychological attachment to opiates. (See Lindesmith 1947 for examples.)

Our theory implies that singling out any particular point in a reinforcement history as the stage of "addiction" is more or less arbitrary. We recognize, however, that there are advantages associated with employing physical dependence as a tacit operational criterion of "addiction." Because the withdrawal syndrome (1) is a salient phenomenon that usually implies a substantial history of prior reinforcement, (2) introduces a potent new reinforcer, and (3) sets a new lower bound on the rate of continued use, the point at which physical dependence appears serves as a useful peg on which to hang a definition of "addict" that signals important changes in lifestyle. This highly visible point divides opiate users into those with and without such major lifestyle changes with great efficiency (i.e., low false-positive and false-negative rates). Indeed some addicts date their being "hooked" from the time they recognized major changes in their lifestyle, such as intense craving, getting fired from their job, or realizing that they preferred heroin to sex (Hendler and Stephens 1977, p. 41).

Convenient though it may be, there are important disadvantages associated with equating addiction with physical dependence as laymen do, or with making it a necessary but not sufficient condition of addiction in a theory of opiate use (Lindesmith 1947). By encouraging the notion that physical dependence is necessary in order for addiction to be present, one also encourages the seriously misleading impression--according to our theory--that a user is relatively safe as long as physical dependence is avoided. This conception opens neophytes to the insidious features of onset underscored by the reinforcement perspective, according to which predependence use is more dangerous than seems apparent because the actual onset accrues gradually with each reinforcement.

COPING THEORY *(p. 38)*

Milkman/Frosch

Isolation of the transition from use to abuse is evasive because drug involvement is viewed in the larger context of addictive processes. The transition to abuse is interpreted as that period in which the individual begins the "progressive or repetitious patterns of socioculturally and/or psychophysically determined seductive behaviors, detrimental to the individual, the society, or both" (Milkman 1979). According to this conceptual model, the individual may embark on an abusive style of living prior to, during, or after involvement with substances.

To be sure, continued use of psychoactive substances often culminates in marked deterioration of systems vital to the individual's adaptive community functioning. In the case of heroin, for example, prolonged use may coincide with decrements in adaptive functions of the ego. Psychological deterioration combined with the pressures of physiological dependency sets the groundwork for a vicious cycle. The heroin user must rely increasingly on a relatively intact ego to procure drugs and attain satiation. Ultimately she or he is driven to withdrawal from heroin by the discrepancy between intrapsychic needs and external demands. Hospitalization, incarceration, or self-imposed abstinence subserve the user's need to resolve growing conflicts with reality.

As in the case of heroin, the alterations induced by amphetamine are initially harmonious with the user's characteristic modes of adaptation. Continued failure, however, to achieve overinflated self-expectations leads to growing conflicts with reality. Increasingly large and frequent pharmacologic supports are called upon to bolster failing ego defense mechanisms. The recurrent disintegration of mental and physical functioning is a dramatic manisfestation of the amphetamine syndrome.

ACHIEVEMENT-ANXIETY THEORY *(p. 212)*

Misra

Initially, drugs are used to seek relief from the pressures of achievement (Misra 1976). Using drugs is relaxing; they provide a quick "chemical vacation" from the stresses and strains of living (Lawson and Winstead 1978). Over a period of time, however, the increase in physical tolerance, on the one hand, and the desire for controlling one's periods of relaxation, on the other, tend to reduce the distance between the work life and the leisure-time activities. Achieving and maintaining a feeling of freedom--of nonachievement or, perhaps, antiachievement--becomes a crucial goal in life. It is at this point that drug use becomes drug abuse. The goal is no longer freedom from the pressures of achievement. Rather, it is to have a feeling of nonachievement. It is the work ethic reversed: a thrill in not achieving.

Drug abuse is, in a sense, a silent protest against the achieving society. It protects us from a sense of failure: I may not be achieving what my neighbors and colleagues are, but I do attain a unique feeling of relaxed carelessness. Addiction forms the nucleus of a subculture of people who all have the same feeling of nonachievement, and friendships and groups evolve around this theme as efforts are made to create and maintain fellowship among the addicts.

ADDICTIVE EXPERIENCES THEORY *(p. 142)*

Peele

Addiction occurs along a continuum, so that it is impossible to designate an exact point at which a drug habit becomes an addiction. Viewing addiction as an extreme at one end of this continuum, we can say drug abuse is any use which tends to move the individual in this direction along the continuum.

There are several criteria in terms of which it is meaningful to evaluate a drug involvement for its addictive potential. Some of these criteria derive from initial motivations for using a drug and from the motivations for continuing use. If a drug is used in order to eradicate consciousness of pain, problems, and anxieties, then its use will tend to be addictive. Another aspect of this type of abuse is the inability of users to derive pleasure from drug use, since they are relying on the drug primarily to avoid unpleasantness rather than for any positive effect. In this case, a criterion for abuse and addiction is that the drug is relied on at regular times for the very predictability of its effects. The most crucial criterion for the addictiveness of an involvement is whether use of the drug destroys or harms other involvements. For when this is the case, abuse moves inexorably along the continuum toward addiction as other reinforcers fall away, and the drug experience becomes the primary source of reward for the individual.

The sign of addiction is the absence of a degree of choice about drug use. The sense of suitability or appropriateness, where certain situations or people rule out use of the drug, is lost. Also lost is the capability for making discriminations with regard to the experience the drug produces. That is, addicts will not reject a brand of cigarette, a type of alcohol, or a narcotic of inferior purity, since they are interested in only the grossest sensations of the drug experience. Finally, identity and continued functioning have become so connected to the effects of the drug that it is impossible for the addict to conceive of life proceeding without the drug.

SOCIAL NEUROBIOLOGICAL THEORY *(p. 286)*

Prescott

The transition from use to abuse of psychochemical substances according to somatosensory affectional deprivation (SAD) theory is dependent upon the following factors:

1. Time of onset of SAD.

2. Duration of SAD.

3. Severity of SAD.

4. Nature, quality, duration, and time period during formative periods of development of intervening, restorative, and rehabilitative experiences of somatosensory affectional relationships. Absence of such experiences is considered to be particularly pathogenic for abusive behaviors.

5. Nature, quality, duration, and time period during formative periods of development of other experiences or factors that result in impaired somesthetic and vestibular functioning, which intereferes with the rehabilitation of somatosensory affectional processes. In general, it is the chronic failure, for whatever reasons, to experience the enrichment of somatosensory affectional experiences in the context of meaningful relationships that sets the condition for the transition from use to abuse. Individuals who do not or cannot make the transition from states of "reflexive" pleasure to states of

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"integrative" pleasure are at risk for making the transition from substance use to substance abuse (Prescott 1977).

NATURAL HISTORY PERSPECTIVE *(p. 215)*

Robins

Typical patterns of changes in dosage of illicit drugs over time have been difficult to study because the strength of street drugs varies so greatly over time and from one location to another that changes in frequency of administration cannot be readily interpreted as changes in dosage. In addition, fluctuating availability and cost greatly influence use patterns. It does appear, however, that frequency of use tends to increase over time, suggesting the development of tolerance to most illicit drugs. How much tolerance develops can be studied only in experimental settings where amount of access to drugs of standard quality is known. Such experiments have been carried out in prisons where prisoners were allowed free access to marijuana cigarettes of standard quality. They were found to use up to 17 or 18 a day. Thus there may be a maximum amount of cannabis that can be metabolized in a day, just as there is for alcohol.

It is known that illicit drugs vary greatly in their addictive potential. It was inferred from laboratory experiments showing the high addiction liability of heroin that first use of heroin would progress rapidly to regular use and then to daily use. This assumption seemed to be confirmed by observing the high rate of relapse to addiction of treated addicts, about two-thirds of whom generally appear to be readdicted within six months after treatment (Stephens and Cottrell 1972). Recent research, however, shows that heroin as used in the streets of the United States does not differ from other drugs in its liability to being used regularly or on a daily basis. O'Donnell et al. (1976) compared the frequency of progression to regular use among men who had ever used a particular drug. He defined regular use as at least twice a month. Progression to regular use was most common for alcohol. All but nine percent of drinkers drank at least as frequently as twice a month. Stimulants and heroin had similar rates--about half of the users ever became regular users. Marijuana showed the least progression to regular use, with only one-third of users doing so. Among users, likelihood of daily use was similar for heroin and for alcohol; that is, about one-third of those who ever used either drug began to use it on a daily basis. Marijuana was next most commonly used on a daily basis, with one-quarter progressing to that level, while only one in ten stimulant users ever became daily users.

Our study of Vietnam veterans found this same pattern for heroin use in the United States. While most narcotic users in Vietnam had progressed to regular use, and half became addicted, in the States heroin was not distinctive from other drugs in the likelihood that men would progress to regular or daily use of it. It may well be that the high addiction liability of heroin found in laboratory experiments and in Vietnam does not apply to the very adulterated product typically purchased in the streets.

What was distinctive about heroin among the returned veterans was that daily users were much more likely to perceive themselves as dependent on the drug than were daily users of barbiturates, amphetamines, or marijuana.

A common belief that has turned out to be largely a myth is that once heroin use begins, it tends to continue indefinitely. O'Donnell et al. (1976) found that of all men aged 20 to 30 who had ever used heroin, only 31 percent had taken any of the drug within the last year. Their rate of continuation with heroin was lower than the continuation rate for any other drug. Those who had ever used stimulants, sedatives, or cocaine had used some of that drug in the last year in about one-half of cases. Those who had ever used marijuana had used some in the last year in two-thirds of cases. Those who had used tobacco or alcohol had almost all used some within the last year. Thus there seems to be much more movement out of heroin use than there is out of use of other drugs. There is remarkably little movement out of the use of tobacco, despite health warnings by the Government.

Again, the same findings applied to the Vietnam veterans. Nearly half of them used narcotics at least once while in Vietnam, and more than one-fourth had used them at least weekly there for a month or more. Nonetheless, at the time we studied them when they had been back in the States three years, they were hardly more likely to be using narcotics than were nonveterans. Thus we found no special likelihood for the use of heroin to persist even among those who had used it regularly. In their second and third postwar years, veterans were no more often readdicted than were nonveterans. (Only two percent of either group were addicted at any time during this period.) The readdiction rate of Vietnam addicts was only 12 percent within the three post-Vietnam years. Our results and those of O'Donnell show that, given the heroin market of the 1970s in the United States, it is possible to use heroin occasionally without becoming addicted. It is still not known how long such occasional use can persist. The time over which addicts have used heroin prior to becoming addicted varies enormously, according to Waldorf (1973). The addicts he studied reported use anywhere from three weeks to six years prior to their first experience of addiction.

GENETIC THEORY *(p. 297)*

Schuckit

The greatest impact of genetics might hypothetically occur in the transition between use and abuse. The best data on this subject are available for alcohol.

In a heavy-drinking society such as ours, strong social factors probably predominate in determining whether an individual will begin drinking and in the decision to take the substance two, three, or more times. The genetically influenced biological factors might have their greatest impact in explaining why in the mid-twenties to thirties most individuals decrease their drinking, while some maintain their high level of intake and even increase their consumption.

In the genetic theoretical framework, each individual enters life with a variety of genetically influenced factors which interact to give a level of biological predisposition toward alcoholism. The best guess, based on family and twin studies, would be either that multiple genes are involved (i.e., a polygenic inheritance) or that one major gene exerts its effect differently in different circumstances (i.e., incomplete penetrance). This genetic predisposition would help to explain why some individuals go on to alcoholism after a number of years of limited drinking while others cut down their intake over time.

The factors could be any one or a combination of such things as a differential metabolism of alcohol, a biologically mediated differential sensitivity to the acute affects of alcohol, differences in subacute affects (e.g., acute tolerance), a differential sensitivity to organ-system damage in the presence of chronic exposure to alcohol, different predisposing personalities, etc. In each of these areas, the genetically influenced biological factors could help either to protect some people from becoming alcoholic (e.g., having an adverse acute reaction to alcohol, such as strong facial flushing [Seto et al. 1978]) or to predispose the person toward alcoholism (e.g., having an acute reaction to alcohol which is less intense than that of other individuals, thus leading to intake of higher levels of ethanol to obtain the same pleasant effects as nonpredisposed individuals).

The persons thus predisposed would enter their early drinking years and progress over time to more frequent drinking and heavier intake per occasion. During their early twenties, the differences between "prealcoholics" and individuals not so predisposed could be obscured by the heavy intake of the average person. At the critical stage in the mid-twenties to thirties, where the average drinker is cutting down, the alcoholic begins to become more apparent through continued high intake and resulting life difficulties. The heavier the genetic loading toward alcoholism and the less intense the environmental factors which might protect one from developing alcohol abuse, the earlier the onset of alcoholism and the more pervasive the alcohol problems are likely to be.

This level of biological predisposition must, of course, interact with the social and psychological environment. Thus, a person carrying the relatively light biological predisposition who is raised in a stable family where abstention or moderate drinking is emphasized and who only experiences periods of stress in the presence of a generally supportive environment may never demonstrate alcoholism. Another person, with the same level of biological predisposition, however, who has a very tumultuous late adolescence, or who lives in a location where alcohol is readily available, or who in the early thirties to mid-thirties goes through a serious life stress such as a divorce will be much more likely to demonstrate alcoholism despite the level of genetic loading.

In adequately evaluating the possible genetic causes of alcoholism, it is necessary to recognize that not everyone who becomes an alcoholic will have an obvious family history of the disorder. In some instances, alcoholism may appear to "skip" a generation if, for example, the son of an alcoholic chooses not to drink or places heavy restrictions on alcohol intake to avoid his father's problems (an example of environmental factors overriding a genetic propensity), while his son (i.e., the grandson of an alcoholic), having no warning about alcoholism, attempts to drink like everyone else only to end up an alcoholic. In other instances, a family history of alcoholism could be hidden because the father or mother had already recovered from alcoholism by the time the child was old enough to observe what was going on. Finally, alcoholism must begin somewhere in a family line, and the alcoholic patient might be the first person in a family with the necessary genetic combination to raise the biological propensity for alcoholism beyond the necessary threshold for expression in that particular environment.

Similar hypothetical mechanisms can be invoked for other substances of abuse. Because the data to date are inconsistent, I favor the hypothesis that the biological factors involved in the propensity toward alcoholism are different from those predisposing toward analgesic or opiate abuse. Polydrug misuse (i.e., abuse of multiple substances other than alcohol or opiates) may be either a separate entity or just the prodromal phase for individuals who are likely to go on to opiate misuse or alcoholism. Of course, an opiate abuser who cannot obtain heroin is likely to misuse alcohol temporarily until the preferred drug is available (perhaps in an effort to treat some protracted abstinence symptoms) (Schuckit 1979a; Green and Jaffe 1977). One cannot rule out the possibility that if both alcoholism and heroin abuse are polygenically influenced disorders, the two problems might have a number of influential genes in common. However, the dissimilarities in age of onset and natural history of these two types of problems lead me to feel that the clearest research approach and hypothetical concept would be to look for different genetic factors for the misuse of separate drugs.

AVAILABILITY AND PRONENESS THEORY *(p. 46)*

Smart

The theory generally predicts a gradual movement from use to abuse or addiction when both proneness and availability allow it. "Abuse," or use with harmful physical or social consequences, is most likely for the heaviest users or those with the greatest initial proneness and availability. Abuse resulting in criminality should also occur when physical or economic availability is low. These points should see a turning to acquisitive crime in order for the drug to be obtained. As true addiction is developed, proneness will lose its original importance, and availability will determine usage. In general, proneness is most important in the early experimental, heavy-use, and nonaddicted phases.

PERCEIVED EFFECTS THEORY *(p. 50)*

Smith

The factors that account for continuation of substance use also contribute to the escalatory process. There are, however, important additional processes that promote the escalation. During the relatively early phases of escalation, consciously recognized dangers associated with substance use can facilitate rather than inhibit use if those dangers are experienced as more exhilarating than anxiety-provoking; if the self-initiated risks bring the user status and social approval; or if the user pits any perceived dangers against his or her competence and self-control, and then treats the matter as a contest which he or she is sure to win. As long as the user continues to perceive the overall gain as greater than the overall cost, use will continue; and the risk of escalation to more dangerous levels of use becomes more likely.

As escalation progresses, cognitive functions (perception, memory, and judgment) tend to be altered in a manner that restricts and vitiates the feedback available to the user regarding the benefits and costs of use. This undermines the reality testing processes that might otherwise alert the user to his or her increasing vulnerability. During the earliest stages of continuing use, the ratio of benefit to cost is seductively attractive. As escalation proceeds, convictions based on earlier observations may cause new and contradictory evidence to be discounted, misinterpreted, or denied altogether.

As escalation advances, there is an increasingly frequent and powerful need to use the substance not for pleasure but simply to avoid the physical and psychic agony of abstinence. The importance of this factor varies from substance to substance and seems to be totally inapplicable for some. Consumption of six cups of coffee in quick succession will produce a rapidly accelerating negative effect no matter how long the user has abstained from drinking coffee, but consumption of six ounces of whiskey during a severe hangover will produce a rapidly accelerating positive effect. Rapid development of unregulated, compulsive use is a serious danger with any substance that can be ingested to alleviate withdrawal distress resulting from previous ingestion. It is well known, for example, that the aversiveness of abstinence effects is powerfully important in driving the heroin addict to readminister.

LIFE-THEME THEORY *(p. 59)*

Spotts/Shontz

Sometimes, the early stages of use of a drug of choice are experienced as extremely pleasant, even overwhelmingly so. For example, a chronic user of amphetamine reported that his first injection of the drug produced a reaction so ecstatic that he has been seeking to recapture it ever since. Whether the commitment of the chronic abuser to his drug of choice develops rapidly or slowly, however, it eventually becomes so intense and deep that the need for it becomes numinous and the user's attachment takes on an almost religious tone.

This "solution" seems all the more desirable to the user, for the chosen substance seemingly produces something akin to the desired ego state without any of the pain and suffering that genuine growth or individuation would require. In this situation, the substance becomes an object of devotion, if not actual worship, a counterfeit symbol of the desired self. When this depth of attachment has been reached, the person is engaged in the ultimate of drug abuse, for his dependence upon it blocks further growth and endangers personal integrity and even life itself in many instances.

Of considerable interest is the fact that few of the men we studied reported that physiological addiction to narcotics, in and of itself, was a significant factor in causing them to continue to use these drugs. However, it must be noted that we studied Midwestern addicts who, for the most part, had access to heroin of only two to three percent purity. Our participants were aware of the reality of addiction and the pains and dangers associated with withdrawal. Indeed, some men avoided narcotics and used other substances instead, precisely because they feared addiction to heroin. Nevertheless, few of the men we studied who used narcotic substances reported that they wanted to quit but could not because withdrawal was too painful. In fact, several took pride in the fact that they had endured withdrawal from heroin and other opiates alone, on their own initiative, more than once. At the same time, it must be admitted that the two heaviest abusers of pharmaceutical narcotics (hydromorphone) we studied never attempted withdrawal and perhaps never will. So at very high levels of usage, it cannot be said that addiction per se is never a factor in continuation. As a group, the men we studied reported greater fear about managing withdrawal from barbiturates than from narcotics.

FAMILY THEORY *(p. 147)*

Stanton

Concerning the important factors in the shift from drug use to abuse, Kandel et al. (1976) propose that there are three stages in adolescent drug use, each with different concomitants. The first is the use of legal drugs, such as alcohol, and is mainly a social phenomenon. The second involves use of marijuana and is also primarily peer influenced. The third stage, frequent use of other illegal drugs, appears contingent more on the quality of the parent-adolescent relationship than on other factors. Thus, it is concluded that more serious drug misuse is predominantly a family phenomenon.

Regarding the relationship between fear of separation that drug abusers' families show and the shift from use to abuse, again, abusers in most cases do not become problematic until adolescence. It is at this point that they should be expected to actively engage in heterosexual and other intense outside relationships. If they do, however, they become less available and less attached to the family. Since they seem to be badly needed by the family, their threatened departure can cause panic. Consequently, the pressure not to leave is so powerful that the family will endure (and even encourage) terrible indignities such as lying, stealing, and public shame rather than take a firm position. Families also tend to protect addicted children from outside agencies, relatives, and other social systems. Rather than accept responsibility themselves, families usually blame external systems, such as peers or the neighborhood, for the drug problem. When parents take effective action, such as evicting their addicted offspring, they often undo their actions by encouraging their return. Families seem to be saying, "We will suffer almost anything, but please don't leave us." Thus it becomes nearly impossible for addicts to negotiate their way out of the family, and they slip into greater abuse as a means for resolving the bind within which they are caught. The transition to abuse, then, can be seen as an example of a family getting stuck at a developmental point in its life cycle and not being able to get beyond it (Stanton et al. 1978).

Even as a young adult the drug user may be closely tied into the family, serving much the same function as during adolescence when the problem (probably) had its onset. This model of compulsive drug use fits many of the data and helps to explain the repetitiveness of serious misuse and the continuity both (a) across generations, and (b) throughout much of a compulsive user's own lifetime. While there is evidence for more frequent substance abuse among parents of drug abusers, relative to parents of nonabusers (Stanton 1979b), the view presented here accentuates the importance of the "identified" patient in the family versus his or her siblings. The limitations of a simple "modeling" theory of drug abuse are underscored, since a particular offspring is usually selected for this role; all children in a family are not treated similarly. Even if they all have equal opportunity to observe the drug-taking patterns of their parents, they generally do not all take drugs with equal frequency. Modeling parents' behavior is only a partial explanation of drug taking by their children.

SELF-ESTEEM THEORY *(p. 157)*

Steffenhagen

The self-esteem theory adequately explains the transition from use to abuse for all dependency-producing drugs. The individual with low self-esteem moves easily to drug abuse because it provides immediate gratification. Individuals with low self-esteem must defend themselves against insecurity and are exceptionally sensitive to changes in the social milieu. Given a situation of perceived social stress they are likely to abuse drugs as a mechanism of freeing themselves from social responsibility. A longing for power to allay all feelings of inferiority could also be provided by the drug.

While low self-esteem is the basic psychodynamic mechanism underlying drug abuse, it accounts for individuals with different personality constellations (different neurotic symptoms) choosing different drugs which might be related to the personality of the abuser, e.g., the triad of neurotic symptoms manifested by the heroin addict: anxiety, depression, and craving.

ROLE THEORY *(p. 225)*

Winick

There are three criteria for a high likelihood of drug dependence: (1) access to dependence-producing substances, (2) disengagement from proscriptions against their use, and (3) role strain and/or role deprivation. If only two criteria are met, there is a lesser likelihood of a user becoming dependent. The transition to dependence is more likely to be crossed when all three criteria are met.

DEFENSE-STRUCTURE THEORY *(p. 71)*

Wurmser

In a narrow sense, wherever the (emotionally) compulsive aspects prevail, regardless of presence of physiologic dependence, use goes over into abuse. The need for drugs assumes drive-like qualities; it becomes peremptory, driven from within, less and less dependent on circumstance, feeding on itself, gratification calling for its own rigid, stereotypical, irresistibly demanded repetition (Kubie 1954)--as is characteristic for all neurotic symptoms, and particularly for sexual perversions. The use itself contributes directly to some of the major underlying conflicts. For example, increased shame and sense of failure and defeat exacerbate the preexisting narcissistic conflict, and thus it increases in turn the need for new pharmacological denial of the shame and low self-esteem. The transition from occasional to such compulsive use is usually not sharply delimited.

Broadly defined, all use of mind-altering drugs that interferes with social, emotional, intellectual, or somatic functioning can be considered abuse--far short of any compulsive pattern. Such substance abuse is enormously frequent; to speak of "transition" would not be appropriate.

Characteristic of both broadly and narrowly defined substance abuse is the superimposed screen of denials and of rationalizations: that it is fun, natural, part of the social ambiance, done for curiosity, "everybody else does it," and so on.

Cessation

PERSONALITY-DEFICIENCY THEORY *(p. 4)*

Ausubel

Because of the almost miraculously efficacious adjustive properties of narcotics for inadequate personalities, users are reluctant to seek cures voluntarily. Very few (at most 20 percent at any given time), are under treatment (DeLong 1975). Our experience at the Lexington Hospital indicates that patients apply for voluntary treatment mostly when they are at the point of apprehension by the law, when they want to reduce the dose that is euphoric, or when they lose their "connections." Few remain to complete the treatment and almost all relapse almost immediately to drug use upon release from the hospital (Pescor 1943b; Vaillant 1966c). This situation was somewhat less true for prisoner patients (Ausubel 1948; Vaillant 1966c). Why then do some chronic addicts volunteer for MMTPs? Apparently, they tire of the continuous hassle of supporting their habits and "settle" for a guaranteed kind of subliminal euphoria (e.g., freedom from psychic tension), as long as it is free and licit, plus whatever euphoria they can derive from polydrug abuse.

Finally, cessation of use seems to be an outcome of delayed (retarded) rather than arrested personality maturation. Most addicts are "burned out" by their mid-forties and then settle down to a conventional existence. Addicts over 50 years of age are a statistical rarity.

ADDICTION-TO-PLEASURE THEORY *(p. 248)*

Bejerot

Discontinuation of a drug stimulation which has reached addictive form may occur for many different reasons.

The social counterforce against the addictive behavior may be so strong that the individual can no longer or dares not continue drug stimulation. In this way Mohammed, in the seventh century, forced the whole Islamic world out of alcoholism. During a 16-year period (1923-1939), the estimated rate of addiction in the United States was reduced by 90 percent by the use of a restrictive and consistent drug policy (Harney and Cross 1961). Between 1951 and 1953, about 20 million opium addicts in China were rehabilitated by means of strong social pressure. When I visited Peking in 1978, I was told that about 90 percent stopped on their own, without interference from society. Shortly afterward (1954-1958), Japan eliminated a widespread epidemic of drug abuse in a similar way. Of the 600,000 estimated intravenous amphetamine abusers, it was only necessary to take action against about 20 percent; the rest stopped as a result of social pressure (Brill and Hirose 1969).

Fear of medical complications is a common reason for discontinuing addictive intoxicant behavior. The addict may have been frightened by a paranoid intoxication psychosis (cocaine, amphetamine), a death from overdose among friends, a severe abstinence experience (delirium tremens), the threat of liver cirrhosis, etc.

Inability to go on any longer with a far-too-expensive and hazardous lifestyle, when many relationships have become strained and complications of all kinds pile up, is usually called "maturing out of addiction." This is not a general phenomenon but is associated with epidemic addiction and seems to require a restrictive policy in society in regard to illicit drugs. The phenomenon is seldom seen in therapeutic or cultural addiction. If a society wages a prolonged and intensive campaign against the use of drugs, results may sometimes be achieved (the reduction in tobacco smoking among physicians and upper class people during the last ten years, the fall in abuse of alcohol to one-seventh in Sweden during the second half of the nineteenth century, etc.).

Reduction in pleasure stimulation and rising discomfort should lead to an interruption. This phenomenon is sometimes seen among elderly alcoholics. The situation is reminiscent of the failing interest in sexual activity on declining potency. Possibly both phenomena are the result of a neurophysiological decline in the effect of pleasure stimulation with rising age.

The introduction of another strong pleasurable experience to compensate for the loss of drug stimulation should lead to the discontinuation of addictive behavior. Religious salvation is a typical example. Only exceptionally can other events fill the same function. This is not surprising since the drug experience is often more pleasurable than sexual satisfaction.

Systematic treatment should be mentioned, even if in practice it still plays a very small part, since ineffective treatment techniques, based on inadequate analyses and models of the nature of dependence, are usually employed. A prolonged and thorough reconditioning of values is one possible method (e.g., Daytop model), as are simpler forms of behavior modification. Unconscious reconditioning (for instance, disulfiram medication to alcoholics without their knowledge) is unethical and unsuitable in practice, but it is theoretically possible. Consciously accepted aversion therapy of various types usually has only temporary effects but may act as a support in a wider program.

DISRUPTIVE ENVIRONMENT THEORY *(p. 76)*

Chein

In areas where drug taking is widespread, a certain number of comparatively healthy and normal persons will, through incontinent use of the drug, develop physical dependence. Such users might be expected to be capable of breaking the dependence. Indeed, this happens in some cases. But while some users manage to free themselves of the habit, most do not. In our investigation of heroin use, both in delinquent gangs and in other cases we studied, there was some evidence that a minority of habitual users manage to discontinue drug use (in our gang sample, there were 14 such cases out of 94 present or former heroin users) (Research Center for Human Relations 1954c). But many more--about one-half--make the effort and fail (Research Center for Human Relations 1957a).

Given the multiple motives of drug abuse, cessation of drug use without effective outside help is impossible for the majority of addicts, and little help is available. Users who are arrested sometimes receive some medical attention, usually limited to easing the pains of withdrawal. In our sample of 94 users who were members of gangs, more than one-half were arrested at one time or another, but only one in ten received any medical attention related to their use of drugs (Research Center for Human Relations 1954c).

Nor are parents of much help. Most do nothing. Those who do try, usually take drastic, punitive action, ordering the boy out of the house, taking him to court, or beating him. Or they remonstrate, giving expression to their hurt, dismay, and unhappiness. In general, few parents seem aware that anything effective can be done to help their children help themselves (Research Center for Human Relations 1954a).

In spite of the lack of help, about one-half of the boys in our sample made more than one effort to stop using drugs. This was especially true of those users who had not previously been delinquent and who came from relatively cohesive families (Research Center for Human Relations 1954a).

Sometimes the most genuine help comes from the user's own friends. Group workers report that gang members sometimes try to dissuade other members who are increasing their intake of heroin (Research Center for Human Relations 1954c). The nature of the support they give indicates that they sense the basic oral needs and the uncontrollable anxiety of the users: They treat them to food, wine, or marijuana, and they try to be with them all the time and watch over them to help at times of stress. The other boys intuitively feel that the user's need for support and his intolerance of anxiety are crucial factors in the process of giving up the habit.

Users do not take easily to psychotherapy. The experience of therapists working with juvenile users points to several common difficulties in treatment: resistance to insight into inner problems, difficulty in establishing rapport with and trust in the therapists, and ease of relapse. Apparently, having discovered an effective palliative in the form of the drug, the user finds it extremely difficult to give it up without at the same time getting some compensatory palliative. Many, if not most, users who have been hospitalized for a period of three to six months relapse immediately upon release (Research Center for Human Relations 1957b; Riverside Hospital 1954). Most users must experience repeated failure in order to realize that they have been overestimating their powers of self-control, that the trouble is not simply an external "monkey on your back," but that they have inherent personality problems that must be dealt with if they are to be cured. The motivation to be cured must be strong. Also, recurrent opportunities for therapy must be so structured that each successive cycle can begin at a more advanced level so that repeated failures do not lead to the conviction that the struggle is hopeless. It is therefore not surprising that even after a number of such cycles, very few ex-users can be said to be cured of the habit.

Drug users need sustained help over a long period of time. Therapists who have had some experience with youthful users and are searching for more effective ways of cure and rehabilitation differ among themselves as to which of several patterns of treatment is likely to prove most successful. There is general concurrence, however, concerning the need to provide supportive and protective services for the addict in the community.

The main kind of support needed for the addict or postaddict is, of course, a sustained therapeutically oriented relationship. Successful cures are, as a rule, with those youngsters who succeeded in establishing genuine contact with a therapist in an institution and who, upon release, continue to see the same person in an aftercare clinic. It would obviously be desirable for the therapist to be able to command services which would help to cushion the addict or postaddict from unduly frustrating or anxiety-producing situations. Vocational guidance and placement is one such service. A "transition home" for those whose family situation is too damaging and impedes their efforts at better adjustment is also advisable (Riverside Hospital 1954). Planning of leisure time and social contacts with nondelinquent peers who are not involved with drugs is also of prime importance: Addicts usually agree that rehabilitation is hopeless if one returns to the same community, the same crowd of "junkies."

INCOMPLETE MOURNING THEORY *(p. 83)*

Coleman

The resolution of the heroin problem is increasingly being sought by treating the family. A national survey of drug abuse and family treatment (Coleman 1976; Coleman and Davis 1978) reported that 93 percent of the respondent clinics (N=2,012) were providing some form of treatment to families. Stanton's (1979d) review of the literature on family treatment of drug problems indicates that this approach and its variations, e.g., multiple family therapy, marital therapy etc., are both "beneficial and effective."

The incomplete loss theory is indeed dependent on family therapy in order for delayed bereavement to be mastered. Some of the clinical interventions for directly dealing with unresolved loss have previously been described by Coleman and Stanton (1978).

The extent to which heroin abuse is discontinued depends also on the degree to which families are able to restructure their relationship patterns, their power and control systems, their roles, and their feedback mechanisms. In terms of the circumplex model, those drug-dependent families that are able to shift and rebalance their cohesion and adaptability, according to life's stress and change, will undoubtedly be less apt to have a relapse of heroin abuse. As a consequence of severing the connection with the loss and grief, families generally develop a renewed sense of meaning, both individually and together.

LEARNED BEHAVIOR THEORY *(p. 191)*

Frederick

Without some change in virtually every factor in the drug abuse/addictive equation, even from a logical point of view, it is difficult to conceive of the cessation of such strongly reinforced behavior, both physiologically and psychologically. Once deeply engrained into the psyche and body of the abuser/addict, major changes are necessary in order to diminish the behavior appreciably, to say nothing of its cessation. Because an alteration in personality is less likely to occur, that factor has been left unaffected in our illustrations as one of the crucial links in the chain of events required for drug cessation. In point of fact, psychotherapy alone is often insufficient to bring lasting changes in ridding the individual of serious drug-taking behavior. An essential component in cessation is the nonreinforcement of key ingredients in order to bring about extinction of the previously conditioned behavior.

The ceasing of drug abuse or addiction primarily involves changes in three factors: destructive motivation (Md), constructive habit formation (Hc), and destructive risk factors (Rd). In such a case, there is a diminution in the motivation to engage in drug-related behavior and an increase in habits that constructively counteract stress. Simultaneously, there is a decrease in the risk factor which no longer tempts the individual to partake in drug use. By substitution of the appropriate values, as the formula shows, the proportion has now reached 0.09 and is thereby approaching zero, where all drug usage terminates.

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{2 \times 2 \times 1 \times 4}{3 \times 5 \times 2 \times 6} = \frac{16}{180} = 0.09$$

COGNITIVE CONTROL THEORY *(p. 8)*

Gold

Effective treatment of the drug abuser requires a multimodal therapy approach. A therapeutic strategy must be developed to help the abuser cope with anxiety, modify faulty cognitive beliefs, learn appropriate interpersonal skills, and interfere with intrusive and unpleasant imagery. Drug abuse affects all aspects of the abuser's thinking, emotions, and behavior, and any therapy that has a narrow focus is likely to fail. The overall strategy is, therefore, to eliminate old patterns and develop new ones that help the individual see himself or herself as competent and in control. To this end, a variety of therapeutic strategies must be employed. Systematic desensitization may be used to help the abuser cope with anxiety, cognitive restructuring or new "self-talk" may be needed to combat the individual's expectation of failure or rejection, and training in the use of imagery and fantasy may help the individual see himself or herself in a more positive light and provide a means to rehearse new interpersonal skills.

BAD-HABIT THEORY *(p. 12)*

Goodwin

The use of drugs described in part 1 produces massive reinforcement based on the combination of genetic vulnerability and classical conditioning. It produces a "bad habit" that is singularly difficult to extinguish. Cessation of use occurs (if at all) when the overall long-term ill effects from drug use greatly outweigh the short-term positive effects. The addict stops, in my experience, because of fear of losing health or life, of losing a spouse and family, of losing a valued job, and, finally, of losing the respect of peers. Permanent cessation occurs when the addict fails to respond to the multitude of conditioned stimuli associated with drug use. Surrounded by temptation--drinking cues--the conditioned response of drinking can be extinguished only if one fails consistently to respond to the cues. After a time, following the laws of Pavlovian conditioning, the habit will cease, although this may take a very long time.

MULTIPLE MODELS THEORY *(p. 18)*

Gorsuch

How continued illicit drug use can be prevented after the initial drug experience or disrupted after it has begun is a function of the model most appropriate for the initial drug experience. Since individuals entered into drug experiences by different paths and since at least the early stages of continued drug use are an extension of those paths, those paths must be disrupted for cessation to occur. Treatment immediately after an initial drug experience would therefore be contingent upon diagnosis of which path was involved.

The nonsocialized individual would be identified by appropriate personality tests showing low scores on conformity and responsibility scales. In addition, descriptions of the initial drug experience would--insofar as they avoided rationalization and self-justification of the "they made me do it" type--show that availability and lack of perception of social constraining factors were prime features in the initial drug experience. Prevention of further drug involvement and continued drug use would be possible either by developing the person into a more responsible member of traditional society or by reducing drug availability. Do note that the nonsocialized individual does not have high levels of motivation for continued drug use, and so social control techniques which prevent access to the drugs through, for example, limiting friendships may be both appropriate and effective if they can be permanently established. Motivation for the nonsocialized user to continue drug use can be decreased if other methods of meeting the needs of novelty and sensation seeking are found.

Iatrogenic users will continue with drug use if the physical pain or mental anguish recurs and another mode of resolving the problems is not available. This would seem, therefore, to be an effective group for traditional medical and psychotherapeutic treatment to provide other sources of help to resolve their problems.

The usefulness of these interventions for cessation of continued drug use with nonsocialized or iatrogenic users depends upon their remaining within their distinctive pathways. If it is only possible to obtain the drug through participating in a distinctive drug subculture, then these individuals may well shift to the prodrug socialization model. A person shifting to this model would be identified by positive past experiences with drugs--which by themselves could produce prodrug socialization--and by their involvements with others in the drug subculture.

It is the prodrug socialized group for which continued use is theoretically most likely. Internal processes and social support systems encourage some use of illicit drugs. The individual's commitment to the drugs means that he or she is more likely to seek out a drug if it is not readily available than someone who is functioning under another model. Further, active countersocialization probably needs to exist in the environment for cessation to occur.

Since the models for psychological and physiological dependence are relatively undeveloped because of a very limited research base, cessation processes for addicts are also relatively unknown. But if addiction were purely physiological, then the medical detoxification techniques should work reasonably well. Psychological dependence would be expected to develop from a long history of reinforcements and would need to be offset by a long series of counterreinforcements. A new subculture may be necessary for most addicts.

Extensive and thorough analysis of the effects of contemporary treatment programs by Sells and his associates (e.g., Sells and Simpson in press) is in keeping with the model. They found that using only detoxification as a cessation technique was relatively ineffectual. This would be expected since contemporary street addicts are psychologically as well as physiologically addicted. (But it should be noted that detoxification techniques are widely accepted in the medical world as effective for individuals who are only physiologically addicted as a result of medical treatment and not psychologically dependent.)

Psychological dependence upon drugs necessitates treatment for that dependence as well as for the physiological component. Sells and Simpson (in press) have found that methadone maintenance, therapeutic communities, and drug-free treatments are all effective, but that the former two are most effective for addicts and the latter for nonaddicted continual users. Though they both disrupt the psychological dependence on illicit drugs, methadone maintenance provides an alternative drug, and therapeutic communities control access and provide countersocialization. In methadone maintenance, the prodrug community is no longer needed because the methadone is supplied through legal channels, and the therapeutic community effectively controls the individual's environment to prevent such involvements. Drug-free treatment is less successful with addicts because the addict remains in the environment and continues to have both access to the drugs and, probably, social support for their use.

The current models suggest that for the nonsocialized user methadone maintenance is most favorable from a long-term perspective. The therapeutic community can be expected to be more effective for the prodrug socialized user since it offers the greater possibility for resocialization. The drug-free approaches are primarily oriented toward psychological dependence. This means that they will be more effective with continual use, but because they have problems with the physiological addiction that accompanies daily use, drug-free treatment approaches will be less effective when both physiological and psychological dependence occurs.

EXISTENTIAL THEORY *(p. 24)*

Greaves

Cessation can be brought about in only three major ways: by controlling the availability of abused substances (source factors), by creating an environment in which the secondary gain from drug use is made excessively painful (social factors), or by volition (personal factors). The first two are seen as transient and artificial in the case of individuals with severely disturbed personalities, who will simply relapse once the external conditions are removed, but may be of benefit in terms of bringing about and sustaining a detoxified state in more healthy abusers.

In any event, voluntary cessation is the only form of cessation which holds forth any promise of sustained cessation. Voluntary cessation can occur under either of two nonexclusive conditions: (1) through insightful realization that drugs are positively destructive to the individual and through resolve to avoid their use whatever the emotional cost, and (2) through treating and training the individual to secure emotional and phenomenal states that are pleasant and substitutive for ongoing drug-induced states.

The problem with insight and resolve is that the drive for the drug of choice remains, much energy is expended in mere coping, and the opportunity for relapse is high. The problem with treating the personality disorder which gives rise to drug abusing behavior is that very few therapists are trained in dealing with problems of dysphoria and existential ennui, prime "illnesses of the spirit" which contribute to drug dependence.

ADAPTATIONAL THEORY *(p. 195)*

Hendin

Drug abusers who stop often say they became repelled by their own confused functioning. "I would dial telephone numbers and actually forget whom I was calling" said one young man in describing his decision to discontinue two years of daily marijuana abuse that kept him in a semiclouded state. He was able to come to this conclusion only after he had resolved a difficult emotional situation involving his school work and his family.

Since stress is a major part of the pattern of use, a diminution of stress can cause the drug pattern to markedly abate or stop. Youngsters who abuse marijuana as part of a maladaptation to school frequently stop when they stop going to school, particularly if their families have learned to accept reduced expectations for academic achievement. Those whose parents continue to treat them with disapproval or contempt are more likely to continue their drug abuse (Hendin et al., in press).

Young people who abuse marijuana to deal with problems related to competition and aggression may cease to do so if they manage to structure their lives so as to ease the pressure on them (Hendin 1973a; Hendin et al., in press). Young women who push themselves into an unwanted pursuit of achievement with amphetamines will usually stop if they alter their goals (Hendin 1974b). Young men who need heroin to function in relationships with women often stop when they are no longer in the relationship (Hendin 1974a).

These young people manage more than a change in the external environment. Many use drugs to strengthen psychological defenses and ways of adapting, and they then learn to maintain these without the drug (Hendin 1975). For example, young people who use psychedelics to fragment experience and detach themselves in ways that make them feel safer may stop when they have achieved a detachment and fragmentation that they can maintain without the help of the drug. Their mood without drugs has come closer to their mood with drugs and made drugs less necessary.

BIOLOGICAL RHYTHM THEORY *(p. 282)*

Hochhauser

Drug use may cease when it no longer serves to provide internal control for the individual. The acquisition of alternative (nondrug) ways of coping may result in the cessation of drug use, or the continued use of drugs may disrupt the chronobiological rhythms so much that the cessation of drugs is necessary to bring the rhythms back under internal control. That is, some addicts may find that narcotics serve to regulate their chronobiological rhythms; others may observe that narcotics disrupt such rhythms, depending on dosage, time (in the rhythmic cycle) of administration, etc. Finally, not using drugs may provide the addict with a greater sense of internal control over perceptions of helplessness.

INTERACTIVE FRAMEWORK *(p. 95)*

Huba/Wingard/Bentler

We believe that the cessation of drug use is a less homogeneous process than the initiation of use because there seem to be groups of individuals for whom different influences are important. Nonetheless, these different groups of individuals may all be considered within the general framework of our theory and many different systems must be simultaneously studied.

One group of individuals seems to cease taking drugs because of behavioral pressure from the intimate support system. For this group, the major reason for ceasing to use drugs is that use fails to be valued within that set of individuals defined as important sources of modeling and reinforcement. A second group of individuals is perhaps more likely to quit of their own volition as a result of realizing undesirable changes in their psychological or organismic status. A third group of individuals may change their drug-taking behavior as a function of some intervention by the sociocultural influence system, usually arrest or forced treatment. This process may operate in part because of product unavailability. Finally, some small group of individuals may cease taking a drug because of limited economic resources.

DRUG SUBCULTURES THEORY *(p. 110)*

Johnson

Drug subcultures theory hypothesizes that drug use and abuse may diminish or cease if and when commitments to subcultural values, norms, and rituals decline or terminate for any combination of reasons. Such diminution in use may be due to reducing interaction or terminating friendships with drug-using peer groups or associates. Peer groups and individuals may switch preferences in drug use because of changing drug fads, declines in availability of a substance, or an increase in availability of another drug. Individuals may switch reference groups and orient themselves toward nondrug activities and associates. Nonusing friends (or those who are moderate users), parents, spouse, or legal authorities may exert direct pressure to reduce or terminate use. For the heaviest drug users--who are frequently sellers--a decision to stop dealing or to sell only to close friends may reduce the amount of drugs consumed.

Critical changes in the life cycle appear to be associated with long-term diminution and almost complete cessation of involvement in drug subcultures and drug use. Evidence from national surveys (Abelson et al. 1972, 1973, 1977; Abelson and Atkinson 1975; Abelson and Fishburne 1976; O'Donnell et al. 1976; Johnson 1978) and local surveys (Kandel 1978b; Brown et al. 1974; Division of Substance Abuse Services 1978; Johnson and Uppal, in press) indicates that the assumption of adult roles significantly decreases participation in the drug subculture for large segments of the regularly using population. Particularly important to diminishing use are marriage, parenthood, full-time employment, and associated changes in friends and peer groups (Brown et al. 1974). Involvement in these adult roles occupies major proportions of the working day, as well as leisure time activities. Little or no effort is expended to seek drug supplies or associates with whom to use drugs. If, however, such persons attend social functions where drugs, especially marijuana, are being used, they may be influenced by the subcultural conduct norms of that peer group to use again. But these will be isolated episodes, which will not occur until another similar social occasion arises.

SELF-DEROGATION THEORY *(p. 128)*

Kaplan

Cessation of the drug abuse (or other deviant pattern) would be likely to occur if and when self-devaluing outcomes outweigh self-enhancing outcomes. In that case the subject would be likely to experiment with alternative modes of deviance, since normative patterns would continue to be motivationally unacceptable as long as they were subjectively and in fact associated with self-devaluing experiences. But insofar as individual maturation and correlated changes in socioenvironmental experiences (including social support systems) reduce the likelihood of self-devaluing experiences, offer new opportunities for self-enhancement, and provide the person with effective coping mechanisms and a correlated realistic sense of control over the environment, the illicit drug use is likely to cease in favor of normative response patterns.

EGO/SELF THEORY *(p. 29)*

Khantzian

The addict's relationship with and dependence on a substance are the result of failures to find more ordinary solutions to human problems of coping with emotional distress and seeking satisfaction for one's needs and wants. Drugs have been substituted as an extraordinary solution for a range of problems, but particularly as a means to cope with major ego and self disturbances. However, the drug "solutions" are at best short term and tenuous, and the long-term dependence on drugs has serious, maladaptive aspects and consequences. As a result, addicts understandably are very often ambivalent about their substances. Often consequences such as legal, medical, and interpersonal crises that result from long-term drug use break down the rationalizations and denial that have supported continuing drug use and dependency. At these times, alternative solutions and satisfactions become possible and realizable and may, for the first time in some and once again in others, make possible the replacement of drugs with human involvements such as alternative compulsive (but benign) activities, religious immersion, relationships, and becoming the treator (versus the treated). This may occur with or without treatment interventions or relationships.

GENERAL ADDICTION THEORY *(p. 34)*

Lindesmith

Theoretical attention centers on voluntary cessation of use when drugs are available to the user. The cognitive features of the proposed theory offer two lines of explanation for this phenomenon.

The first is that in the process of getting hooked, a revolution occurs in the addicts' self-concept. They cannot escape the fact that they have become pariahs, viewed with disfavor and strong disapproval in the culture of which they are part. Prior to their own addiction, the user had usually shared these views. Beginning addicts thus face a loss of self-esteem and tend to become ambivalent. On the one hand, they cannot help but crave the drug; on the other, they are unhappy about belonging to a group viewed with strong suspicion and dislike. They therefore resolve to kick the habit and sometimes succeed for varying periods of time. During such periods of abstinence, the other side of their ambivalence tends to take over and usually leads them to abandon the effort. With increasing age and duration of addiction, it appears that such periods of voluntary abstention become longer and more frequent and more often permanent.

The second point is that as regular daily consumption is continued, users notice that they are getting less and less at a higher and higher cost. The main effect of the drug is now to maintain "normalcy" between shots. "Highs" become progressively more brief and difficult to obtain. The ensuing and growing disillusionment may contribute to a decision to quit the habit, a decision made slightly more palatable by the realization that even short-term abstention will restore the initial sedative-euphoric effects of the drug and reduce the size of the habit.

HYPERACTIVE ADOLESCENTS THEORY *(p. 132)*

Loney

While our theory is silent to date on the determinants of naturally occurring reduction or cessation of drug use, it does suggest that preventive and treatment efforts might aim at reducing children's aggression and/or at improving certain aspects of their environments. Behaviorally oriented parent training (Patterson 1976) comes quickly to mind as a way to interrupt the procession from temperamental irritability to childhood disobedience and fighting to adolescent substance abuse and delinquency. Treatment with CNS stimulants is often initiated in the hope that it will prevent the development of a variety of secondary emotional and behavioral problems, including drug abuse, and it is often withheld or discontinued for fear of harmful side effects, including drug abuse. In fact, available findings indicate that neither the hope nor the fear is warranted. When we are able to compare medicated and nonmedicated children at adolescence, we will be better able to determine the conditions under which early treatment with CNS stimulants has either iatrogenic or immunizing effects on subsequent drug abuse.

COMBINATION-OF-EFFECTS THEORY *(p. 137)*

McAuliffe/Gordon

An addict comes to discontinue drugs in two ways: (1) by being physically prevented from continuing, for example, through incarceration, and (2) by choosing to stop, at least temporarily. Only the second requires explanation. According to our theory, drug taking stops voluntarily because of changes in contingencies of reinforcement. The key theoretical questions concern how the contingencies change.

Much research suggests that opiate use stops initially because one or more of the numerous risks surrounding illicit drug use suddenly becomes imminent (e.g., threat of incarceration, medical complications such as overdose and hepatitis, abandonment by spouse and family, loss of job, and psychological depression). Ordinarily, drug use persists despite these risks because, in contrast with the immediacy and certainty of the rewarding effects of opiates, the risks are usually psychologically remote and often discounted (Hendler and Stephens 1977, p. 40). Moreover, throughout much of their careers, many addicts succeed in avoiding these unwanted outcomes; those hazards that are encountered are either relatively minor (e.g., a misdemeanor conviction) or are made tolerable as long as one has heroin; and some of the difficulties are so gradual in onset that addicts are able to adjust to them.

However, from time to time in the lives of most street addicts in our samples (e.g., McAuliffe and Gordon 1974) and in Waldorf's (1973), the addict is confronted by a crisis in which one or more of the major risks suddenly impends. An example of a crisis in the life of a typical street addict would be getting arrested for burglary and finding that as a result his wife was leaving and he was being fired. With the contingencies of overall reinforcement so abruptly changed, the addict will often alter his behavior if a reasonable path opens to him. Perhaps by entering a methadone program he can avoid prosecution and placate his wife and employer as well.

Discontinuance of drug use occurs in similar ways for other kinds of addicts. Physician addicts generally continue taking opiates until discovered by authorities (Winick 1961a). When then threatened with loss of their license to practice medicine and constrained by suspension of their prescribing privileges, physicians ordinarily stop using drugs, at least temporarily (Jones and Thompson 1958). Here, the unwelcome changes in employment and lifestyle contingencies are drastic indeed, and easy access to the positive reinforcement of opiates can be terminated effectively by outside intervention. Soldiers who became mildly addicted in Vietnam also experienced marked changes in their circumstances when returned to the United States, and as a result, although they had been euphoria-seeking users, most stopped using heroin (Robins 1974a; Gordon 1979). The changes of behavior by addicts under adverse conditions are consistent with observations from laboratory studies showing that both animals and humans reduce the frequency of their drug-taking response in the face of increased work requirements and punishment (Griffiths et al. 1978, pp. 29-31).

Addicts vary in the extent to which their stopping drug use indicates an intention to abstain permanently. Our Baltimore street addicts readily distinguished between what they termed "sincere" efforts at stopping and other occasions when, for example, entering a methadone program was regarded as merely a temporary expedient adopted because of social pressure from family and the justice system or because of exhaustion resulting from the hardships and demands of the addict lifestyle (Agar 1973; Preble and Casey 1969).

Indications are that street addicts, even when "sincere," seldom discontinue opiates because they have lost interest in the positive effects opiates provide. Street addicts rarely claim that they stopped because they no longer liked the high; it is the life that they can no longer abide (Brown et al. 1971, p. 641). Waldorf (1973, p. 147) points out that most addicts use heroin heavily right up to the point of stopping--there is no gradual tapering off. (See also Robins 1974a, pp. 1, 35.) Once in a methadone program, addicts often use heroin, other drugs, or alcohol as supplementary or substitute intoxicants (Bazell 1973; Bourne 1975; McGlothlin 1977, tables 1 and 2; Stephens and Weppner 1973, table 3; Weppner et al. 1972, table 3). Similarly, addicts receiving antagonist therapy commonly stop taking the antagonist so that they can again enjoy the effects of opiates (Curran and Savage 1976; Haas et al. 1976). This persistence of the potential for enjoying opiate euphoria, in combination with the relative permanence of a reinforcement history once acquired, plays a crucial role in relapse even for earnest discontinuers, and by default places the major burden for motivating abstinence on contingencies located outside the drug effects proper.

Abstinence from heroin use does not always represent a radical readjustment in lifestyle, for many abstaining addicts compensate by increasing their use of alcohol or other drugs, including less demanding opiate drugs such as cough medicines containing codeine, and paregoric. Drug effects of somewhat lower quality are thus achieved at less cost and risk. Waldorf (1973) found that 51 percent of his sample admitted substituting excessive use of other drugs or alcohol when stopping heroin use: 24 percent drank heavily, 13 percent used drugs to excess, and 14 percent did both. Methadone maintenance may be viewed as an institutionalized example of this substitution method of giving up heroin, and it is noteworthy that methadone programs have found that many patients also supplement their methadone with other drugs or alcohol (Bazell 1973; Bourne 1975, p. 101; McGlothlin 1977; Stephens and Weppner 1973; Weppner et al. 1972).

It is important to recognize that by substituting "less serious" drugs for heroin, addicts follow a pattern which Kandel (1975) has also found among adolescent users of many different drugs. Drug users do not regress directly to nonuse, but to lower categories of less serious illicit drugs or to legal drugs. Thus, substitution of less serious illicit drugs may be an indication of partial rehabilitation, even if it is not the desired end point of the rehabilitation process. (For a similar view, see Goldstein 1976b.)

In our view, successful reintegration into conventional society, sharing in its rewards, and avoiding the active peer group are essential for long-term or permanent abstinence by addicts. When addicts were successful in finding or reuniting with a spouse or girlfriend and in finding a job, this success was commonly cited as a factor in promoting abstinence. Most of the addicts found that they were happy living more conventional lives and felt no need for drugs or socializing with other addicts. Stephens and Cottrell (1972) point out that although addicts with jobs had a significantly better chance (14 percent) of remaining abstinent, 81 percent did relapse.

Goldstein (1976b) has emphasized the reciprocal effects of reducing drug involvement and of social rehabilitation on each other. Since progress along either of these dimensions can easily be upset by a setback on the other, this perspective helps, along with the psychopharmacological factors of the preceding section, to account for the apparent fragility of abstinence (e.g., Ray 1961; Waldorf 1970).

Individual differences in adoption of the stereotypical addict lifestyle help explain the abstaining addict's subsequent readjustment to conventional society. We (McAuliffe and Gordon 1974) and other researchers (Brotman and Freedman 1968; Stimson 1973) have found that addicts vary greatly in the extent to which they embrace the stereotypical addict lifestyle. Some addicts never become strongly oriented toward heroin's pleasures; they continue to work and have a family, and they rarely commit crimes. Other research has shown that such individuals are more likely to remain abstinent once they stop using heroin than are addicts who are more like the hardcore addict stereotype (McAuliffe and Gordon 1974).

Although many observers have noted that the most consistent predictors of continued abstinence are the addict's age and length of addiction (e.g., Waldorf 1970), there are a number of possible interpretations of this tendency. Winick (1962a) concluded that addicts stopped using opiates as they matured because the crises of youth, which Winick assumed originally sparked drug use among most addicts, were no longer operative. There has been only some evidence to substantiate Winick's theory, and other explanations may be offered. Another potentially contributing factor is the tendency of an age cohort of addicts to be diminished in size by attrition due to death, incarceration, and remission (Robins and Murphy 1967). Thus, the negative consequences of addiction also take their toll indirectly via their effects on the addict peer group as a whole. Older addicts, therefore, have a less potent subculture to resist, since their addict friends and close acquaintances--persons most likely to offer them a shot--have become fewer in number. Moreover, we have found that older addicts tend to see the social aspects of drug use as less rewarding as time goes on. Whereas most of our respondents at first preferred shooting up with other addicts more than shooting up alone, by the time of interview they preferred shooting alone. Thus, for the older addict using heroin may be less attractive than it was for the younger addict in many respects.

Being a heroin addict becomes harder and harder as the addict career continues (McAuliffe 1975b). Once convicted of several crimes, the addict will be well known to the police. Subsequent convictions are likely to result in long sentences and little hope of parole. A number of our respondents mentioned that they have abstained because they felt certain that they would end up in jail again and they had had enough of incarceration. The risk of prison thus no longer seems psychologically remote. Moreover, sources of money for drugs other than crime also dry up. Jobs become harder to get, and family, spouse, and nonaddict friends now refuse to help the addict anymore. Veins collapse so that intravenous use is difficult or impossible (e.g., McAuliffe and Gordon 1974, p. 822), and the health of older addicts often deteriorates to the point that they can no longer endure the hardships of the addict lifestyle. Many ex-addicts claim that they became tired of the demanding lifestyle of "ripping and running." (For a description of the demands, see Agar 1973; Preble and Casey 1969.) The prospects of pursuing the life of the heroin addict again must appear rather grim to the older abstaining addict. It is not surprising that many find the normal life of an abstaining ex-addict, tame though it may seem, as the more desirable of the options available.

COPING THEORY *(p. 38)*

Milkman/Frosch

Cessation of a pattern of substance abuse usually occurs in the context of cognitive/emotional reorganization. Fears of societal reprisal and physical deterioration combined with increasingly sophisticated group treatment techniques may lead to the selection of alternate or substitute modes of adaptation and gratification.

Prior to cessation, an individual may change his or her drug of choice, concurrent with intrapsychic redistributions. The amphetamine user, for example, may encounter repeated failure to achieve overinflated self-expectations leading to increased deficits in self-esteem and the abandonment of over-compensatory defense mechanisms. Heroin, barbiturates, or alcohol may become the subsequent drug of choice.

In some cases (e.g., alcoholism), religion may serve as a potent alternative to former styles of living. In the case of heroin, identification with non-drug-oriented members of the therapeutic community may provide an alternative sense of belonging and group identification. In some instances, relatively spontaneous recovery, with little or no therapeutic intervention, is observed. The body may develop a physiologic intolerance for a particular chemical (e.g., alcohol), or the individual may discover more developmentally mature mechanisms for coping (e.g., new interpersonal relationships).

ACHIEVEMENT-ANXIETY THEORY *(p. 212)*

Misra

The cessation of drug use is perhaps directly related to a decision to change one's lifestyle. In a clinical sense, drug abuse is a variant of coping behavior. However, drug addiction is indicative of a way of life, with its own beliefs and values. Two unique features of this lifestyle are (a) complacency toward time and space and (b) denial of responsibility. Therapeutic programs for drug addicts should consider setting realistic goals for the clients. It must be emphasized that treating addiction is not the same as treating, say, a case of influenza. The target symptoms are not easy to identify. We have, perhaps, to deal with a whole lifestyle and not just a symptom or two.

An addict is more or less a symptom of a "sick" social system. He or she symbolizes the response to the anxiety of achievement. Helping addicts should be a very slow and gradual process by which they (a) are encouraged to develop a sense of responsibility and (b) are persuaded to limit their behavior within the constraints of time and structure. This is not easy. It would not be unrealistic, for instance, to expect 60 percent of the clients in a drug program to exhibit a 40 percent increase in their sense of respect for time (e.g., keeping the counseling appointments) after being in the program for six months. The goal of the drug programs should be to improve the employability of the clients, rather than to cure addiction. Developing a sense of respect for time and structure seems to be a more realistic goal than helping addicts to stop abusing drugs.

ADDICTIVE EXPERIENCES THEORY *(p. 142)*

Peele

To cease being addicted to a drug, one must develop the ability to derive real rewards from the world to replace the unrealistic rewards that the drug provides. Such rewards include those which come from basic competence, from the ability to carry out meaningful work which is rewarded by others, from the capacity to form intimate relationships with other people, and from having a comfortable and satisfying relationship generally with one's environment. While it may be necessary to restrict or eliminate drug use in order to accomplish these goals, simple cessation of use in no way implies that these goals are accomplished.

A person will need to develop alternative means for gratification which will supersede the drug experience. This may be accomplished in a number of ways, including an analysis of the feelings which led to use of the drug, exploration of more functional methods of coping with these feelings, and practicing actions which are incompatible with reliance on the drug experience. Initially, these behaviors may be irresolute and inadequate to offset the rewards the user feels the drug provides. During this transition period, it may be necessary to utilize an artificial or therapeutic setting to help establish the new patterns of activity and self-reliance.

There are instances of self-initiated programs for removing the reliance on a drug. These can occur with any drug--from cigarettes, to alcohol, to narcotics. The greatest amount of research has been done on those who cease to be addicted to a narcotic, the process of "maturing out." What happens in these cases is that individuals--frequently adolescents--become addicted to heroin at a time when they are incapable of forming a solid relationship with the world on their own. Subsequently, they either replace the drug addiction with a dependence on an institution--such as a hospital or a jail--or their capabilities and self-concepts mature to a point at which they can become drug free (Winick 1962a).

SOCIAL NEUROBIOLOGICAL THEORY *(p. 286)*

Prescott

Cessation of use is dependent to a very large degree upon an individual's ability to change the social, physical, and cultural environment that would make possible the restoration of somatosensory affectional experiences within the context of meaningful human relationships. Without this change, cessation of use becomes extremely difficult and short lived. Purely cognitive strategies to induce change are unlikely to be successful. The basic psychophysiology of attachment processes must be treated so that affectional bonds can be restored in order to effectively realize cessation of use. Psychopharmacological therapies that directly stimulate somatosensory and somatopleasure processes of the CNS/ANS may be a necessary first step in the process of somatosensory affectional rehabilitation in particularly difficult cases. The transition from psychopharmacological therapies to somatosensory affectional therapies is a necessary and essential transition for the realization of cessation of substance abuse. Altered vestibular functioning, hydroflotation and hydrosuspension therapies, and massage and somesthetic therapies to reintegrate the vestibular-somesthetic and other sensory processes appear necessary for the reconstruction and rehabilitation of the psychophysiological mechanisms of attachment behaviors. The degree to which those psychophysiological mechanisms can be rehabilitated for the purpose of establishing affectional bonds will determine in large part the nature and duration of cessation of substance abuse.

NATURAL HISTORY PERSPECTIVE *(p. 215)*

Robins

Cross-sectional studies of young people generally find more drug use among the single, and those without full-time jobs. Drug use is also rare among those over 30. Together these facts suggest for this natural history of drug abuse up to the point of addiction that drug use probably tends to diminish with aging and as young people take up traditional roles of marriage and work. As yet, there are too few longitudinal studies following drug users through the termination phase to be certain that these are the correct inferences to draw. It is possible that young people who enter adult roles early are just those who never used drugs.

GENETIC THEORY *(p. 297)*

Schuckit

Cessation can be understood only in the context of the natural history of substance abuse, especially alcoholism. Alcoholics do not get drunk in their mid-twenties and stay intoxicated until the day they die. Rather the natural history of this disorder appears to include periods of abstinence, times of limited or "controlled" alcohol intake, and periods of excessive alcohol intake with resultant problems. These individuals appear to move spontaneously from one state to another, and thus, whatever the causes of alcoholism in the first place, the course of the problem includes temporary cessation of drinking which alternates with periods of exacerbation of problems (Schuckit 1979a; Smart 1976b; Ludwig 1972). The most likely explanation for the series of exacerbations and remissions is a changing balance between factors predisposing individuals to drink and those making them tend to stop or at least to cut back.

Biologically mediated genetic factors may play a role in this temporary remission. For example, genetically influenced metabolism of alcohol might change over time, the development of tolerance might mandate that a person stop or cut down on intake in order to be able to begin drinking or abusing drugs again at a lower level, genetically influenced organ sensitivity to alcohol might lead to such severe illness that an individual must stop to "take a breather," etc. These hypothesized factors probably interact with environmental events which lead to a crisis, a reevaluation of the cost versus the benefits of drug use or drinking, and a resolve to (at least temporarily) stop the intake of the substance in order to preserve a marriage, keep a job, avoid problems with the police, etc.

Cessation of abuse can be long-term or even permanent. Long-term followups of drug abusers and alcoholics have demonstrated a rate of permanent "spontaneous remission" (or at least responses to nonspecific interventions) in 10 to 30 percent of substance abusers (Smart 1976b; Drew 1968; Vaillant 1973). This spontaneous remission is, once again, probably due to a combination of genetically influenced biological factors and environmental events. It may relate to changes in unique attributes of metabolism, acute reactions to the drug, subacute reactions, chronic vulnerabilities, or personality factors associated with increasing age. Added to this might be the development of more end-stage organ disease, probably influenced by genetic factors, which make the individual so ill that continued misuse is impossible. At the same time, the recognition with increasing age of one's own mortality coupled with the number of years invested in a job or in a marriage may combine to create an environmental force which, becoming stronger each year, finally precludes any further substance abuse.

One final note must be said about the alcoholic or drug abuser who seems to return to achieve "controlled" use of a substance. Even when one excludes the temporary periods of abstinence and low levels of abuse which are seen in the course of most substance disorders as described above, there remains an unknown percentage of individuals (probably around 10 percent) who do seem to be able to return to controlled use over a protracted period of time (Orford et al. 1976). A number of these individuals probably had secondary alcoholism, usually with primary affective disorder, with the result that their ability to drink or use drugs in a moderate manner returns as soon as the primary disorder goes into remission (Schuckit and Winokur 1972). For the rare primary alcoholic or primary drug abuser who does return to controlled substance use over an extended period of time, one could hypothetically invoke the same types of genetic and environmental factors discussed above regarding spontaneous remission.

AVAILABILITY AND PRONENESS THEORY *(p. 46)*

Smart

When availability disappears totally, all drug use must, by definition, cease. More problematic is what occurs when availability decreases by smaller amounts. It would be anticipated that most curious or experimenting users will be willing to make a limited amount of effort to obtain a drug. Likewise, they will be sensitive to price rises, which are likely to discourage greatly their further drug use. The curious student with no spare cash is unlikely to start using cocaine at $50 per time unless it can be obtained free. Most experimenters who sought only a brief experience with a drug would desist from further use if the price went up greatly, if far more effort was required to obtain it (e.g., going to a new city or social group), or if they had to take more risk (e.g., associate with known criminals). Most would stop drug use altogether, wait for a more propitious time, or shift to another more available drug. Probably changes in the availability of particular drugs explain the common finding of multidrug use among users.

With drug addicts (i.e., opiate addicts), cessation of use will depend upon large changes in proneness or availability. Since they will have withdrawal symptoms, they will be unlikely to stop usage because of small price rises or decreases in physical accessibility. They will raise more money or shift to different dealers or locales or to a new drug with similar effects (e.g., from opiates to alcohol or barbiturates). Total cessation of use will, in practice, depend more upon zero or low availability than on reductions in proneness. Reductions in availability in the life of the addict occur because of supply problems (police activities), geographic changes (as in the case of Vietnam veterans), confinement in jails, or admission to a drug treatment program for detoxification or other long-term stay. Reductions in psychological or social proneness seem less likely for addicts, as they would result from major life readjustments, intensive and effective psychotherapy, or other rare events.

PERCEIVED EFFECTS THEORY *(p. 50)*

Smith

Whatever the amount, frequency, and pattern of substance use, cessation will not occur until the user perceives the disadvantages of use as outweighing the benefits. The subjective character of this cost-benefit relationship is emphasized because in many (perhaps most) instances the user perceives use as having a net positive effect long after most outside observers would have concluded that the cost-benefit relationship had shifted from positive to negative.

Cessation is a single event, but it reflects the outcome of a protracted process of assessment that has been ongoing (consciously and unconsciously) throughout the period of continuing use. Factors that determine when (if ever) cessation will be perceived as being more advantageous than continuation include the following: changes in the user's life circumstances; increasing anxiety and concern regarding various potential losses associated with continuation; reduced effectiveness of defenses that impair the reality testing processes by which costs and benefits of use are assessed; substitution of more cost-effective satisfactions for those previously obtained through substance use; increased attribution of importance to longer term costs and benefits associated with continuation of use; and a clearer recognition of the obstacles to achievement of important life goals posed by continuation of use. Examples of altered life circumstances and specific anxieties that might facilitate cessation are given in part 1.

Continuation of use is sustained in part by the tendency to accord present satisfactions and costs disproportionately greater weight than future ones. The probability of cessation is increased by any shift in orientation away from the present toward the future, or by any increased capacity to forego immediate gratifications to achieve more important subsequent ones. Cessation is more likely if the user views continuation as being incompatible with achievement of long-term, significant life goals, especially if those goals are part of a clearly defined, carefully considered career plan that seems both achievable and likely to bring important future occupational, financial, social, and personal satisfactions.

LIFE-THEME THEORY *(p. 59)*

Spotts/Shontz

Discontinuation may occur in response to either extrinsic or intrinsic conditions. An important group of extrinsic conditions is related to availability of the desired substance. When one's sources of supply dry up or when one runs out of money or other ways to obtain a drug (e.g., by theft), its use is, of necessity, discontinued. Generally, however, discontinuation under these conditions occurs easily only if another substitute substance can be found. Otherwise, in cases of truly heavy usage, acts of desperation may be attempted to maintain access to the needed drug.

Intrinsic factors are of two types, physical and mental. Naturally, discontinuation of use follows the death of the user, a factor that is not to be belittled in groups who live in a dangerous subculture or practice heavy use of illicit substances. Discontinuation often follows also when the person becomes physically unsuitable as a vehicle for drug use, due to collapse of usable veins or, perhaps, to incapacity as a result of brain damage or physical illness.

Mental causes of discontinuation seem to be of two main types, both of which reflect changes in the status of the process of individuation. The first is gradual and is actually organismic because it involves both mental and physical factors. It could also be called existential because it may result from sheer aging, increased maturity, or the "burning out" of the conflict(s) that maintained drug use in earlier years. Often, this type of change is accompanied by anxiety over the awareness of personal deterioration and possible death, accompanied by the feeling that "I wish to spend my last years in peace."

The second type of mental change is sudden and has nearly all the features of a religious conversion. The person realizes that the drug he has been taking is a false god that has been leading him into what he now feels were evil and sinful ways. He finds needed strength in a new source of power (perhaps a counselor, a parent, a wife, a religious figure, or a rehabilitation program) and transfers all his devotion from the drug to that new entity. Obviously, the success of this form of change depends upon the success with which the new god-figure serves as an adequate symbol of selfhood and individuation.

FAMILY THEORY *(p. 147)*

Stanton

Lennard and Allen (1973) have emphasized that, in order for drug abuse treatment to "take hold," the social context of the abuser must be changed. Applying drug abuse to its context in the family, one could assert, as have Bowen (1966), Haley (1962), and others, that in order for the symptom to change, the family system must change. Conversely, treatment which changes an individual also affects that person's interpersonal system. However, if broader system change (rather than change primarily in the individual) does not occur, the chances for prolonged cure are reduced, for there can be considerable pressure to revert to the old ways.

The often-referred-to phenomenon of "maturing out" of drug abuse or addiction is relevant here. However, this concept does not go far enough. It is an individual-oriented concept and does not help to explain why some addicts mature out and others do not, and why some are much older than others when they do. It is more instructive to examine what is going on in the abuser's life when use ceases, i.e., what changes are taking place in the interpersonal systems--most notably the family. More explicitly, one could ask what family life cycle changes have occurred: Has either parent died? Has a sibling developed problems? (Stanton 1977b). Has the abuser recently had a first child? Has a new support system developed for the parent(s)? Some abusers have been known to "buy" freedom by substituting another person for themselves vis-a-vis their parents; they give the parent(s) a newborn or other child to raise as a replacement, thus taking pressure off themselves (Stanton et al. 1978). These and related questions about events in the abuser's intimate interpersonal system must be answered in order to gain a more meaningful understanding of the critical variables surrounding cessation of use.

SELF-ESTEEM THEORY *(p. 157)*

Steffenhagen

In the framework of the self-esteem theory, we explain cessation on a basis of two sets of conditions, individual and situational. In the first instance, we postulate that if an individual's self-esteem were raised (through therapy), he or she would quit using drugs because they would no longer serve as a mechanism for coping with inferiority. In the second case, an individual may quit drug abuse as a result of a superimposed set of conditions, such as being forcefully detoxified in the Army, being arrested and jailed, or being socially pressured into joining Alcoholics Anonymous or Synanon. Drug abuse may also cease if the social stress is removed or if interpersonal satisfactions are increased so that the abuser's fragile psychological balance does not require this primitive coping mechanism.

Cessation can take place on a microlevel or on a macrolevel. On a microlevel, self-esteem can be increased so the neurotic coping mechanism is not necessary--the person would be cured. On the macrolevel, it is the situation which is responsible for cessation, although the personal need might remain--the individual would be rehabilitated, not cured.

CONDITIONING THEORY *(p. 174)*

Wikler

If it is accepted that conditioning factors (classical and operant) and protracted abstinence play an important role in relapse, then addiction must be regarded as a disease sui generis, and regardless of antecedent etiological variables (e.g., premorbid personality) its specific features must be eliminated by appropriate procedures. As Wikler (1965) pointed out, mere detoxification, with or without conventional psychotherapy and enforced abstention from self-administration of opioids, will not prevent relapse when the former addict returns to his home environment or other environments where the conditioned stimuli are present (drugs readily available; "pushers" and active addicts). What is needed in treatment after "detoxification" is active extinction of both classically conditioned abstinence and operantly conditioned opioid self-administration. This would require repeated elicitation of conditioned abstinence and repeated self-administration of opioids under conditions that prevent the reinforcing effects of opioids (production of "euphoria," reestablishment of physical dependence). Under such conditions, conditioned abstinence should eventually disappear and self-administration of opioids should eventually cease. With the introduction of the orally effective, long-acting opioid antagonist, cyclazocine, by Martin et al. (1966), it became possible to prevent the reinforcing effects of opioids by daily administration of cyclazocine. If former addicts are maintained on blocking doses of an antagonist for a sufficient length of time (e.g., over 30 weeks) to permit disappearance of protracted abstinence, and if active extinction procedures are carried out during this period (Wikler 1973d), then administration of the antagonist may be discontinued, with the expectation that relapse will be much less likely to recur.

ROLE THEORY *(p. 225)*

Winick

The theory suggests that a population or subgroup will tend to cease drug dependence when (1) access to the substances declines, (2) negative attitudes to their use become salient, and (3) role strain and/or deprivation are less prevalent. If all three of these trends are operative, the rate of drug dependence will decline more rapidly than if only one or two trends are relevant.

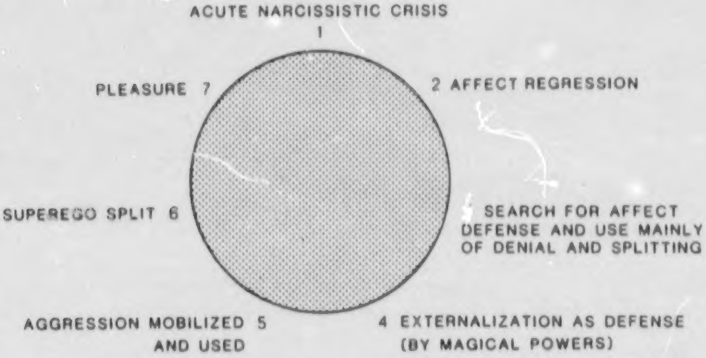
The narrow clustering of age at "maturing out" in different samples at different times (mean ages of 33, 34, and 35 in, respectively, Ball and Snarr 1969; Snow 1974; and Winick 1962a) suggests that there are underlying regularities in this process. Ethnicity, sex, residence, access to and salience of drugs, attitudes toward drugs in an area, and the extent to which nondrug-related roles are plausible and reinforced, contribute to cessation of drug use, as does the extent to which the user experiences less role strain and/or deprivation.

DEFENSE-STRUCTURE THEORY *(p. 71)*

Wurmser

Like other neurotic symptoms, compulsive drug use can recede or disappear--either "spontaneously" or under the impact of outside events (including treatment). Wherever the earlier described circle (figure 1, p. 356) is interrupted, drug use recedes. When there is a radical change in the "narcissistic equilibrium," i.e., when there is dramatic reason to feel proud, not ashamed, not guilty anymore, the wheel may be stopped. Not rarely, however, is it precisely apparent success that keeps it going, namely, when unconscious guilt is an important factor; then every triumph immediately has to be followed by an act of severe self-punishment and self-sabotage. In these frequent cases, actual suffering and punishment inflicted from the outside bring about sudden stopping of the drug use. With the great need to depend on outside ideals as protectors and givers, the strong intervention by a cause or person that can function as a meaning-giving ideal may make the dependency on a drug for increased self-esteem unnecessary. This is "cure" by displacement of idealization: conversion to a religion or sect; entrance to a powerful organization; joining Alcoholics Anonymous, a political cause, or following a charismatic leader; an intense love relationship; transference to a therapist--all are often observed to bring about cessation of drug abuse.

FIGURE 1.—***Graphic representation of the psychodynamic pattern of drug use***


ACUTE NARCISSISTIC CRISIS
1
2 AFFECT REGRESSION
SEARCH FOR AFFECT DEFENSE AND USE MAINLY OF DENIAL AND SPLITTING
4 EXTERNALIZATION AS DEFENSE (BY MAGICAL POWERS)
AGGRESSION MOBILIZED AND USED 5
SUPEREGO SPLIT 6
PLEASURE 7

Relapse

ADDICTION-TO-PLEASURE THEORY *(p. 246)*

Bejerot

Repeated relapse is part of the picture in most addictive conditions, regardless of whether they are pharmacologically induced or of a nondrug type (gambling, obesity, etc.). If sentiments are reactivated through external stimuli and if dependent individuals consider the conditions for a relapse to be favorable, they may decide that they can permit themselves a relapse, particularly if they believe that they have now gained control over the addictive behavior (drinking, smoking, overeating, injections, etc.).

INCOMPLETE MOURNING THEORY *(p. 83)*

Coleman

Family therapy offers a sense of "roots" and reinforces the continuity of the generations. It also provides an opportunity for individuation of each member. With optimal balance, future losses should be met with more creative responses. As Boszormenyi-Nagy and Spark (1973) suggest, ". . . death, loss and grief can be made into resources for significant relational gains." Unfortunately, for those families that do not successfully change their structural and functional relationships, some relapses can be expected, particularly when the system is threatened by additional loss or separations.

METABOLIC DEFICIENCY PERSPECTIVE *(p. 256)*

Dole/Nyswander

Implicit in methadone maintenance programs is an assumption that heroin addiction is a metabolic disease, rather than a psychological problem. Although the reasons for taking the initial doses of heroin may be considered psychological--adolescent curiosity or neurotic anxiety--the drug, for whatever reason it is first taken, leaves its imprint on the nervous system. This phenomenon is clearly seen in animal studies: A rat, if addicted to morphine by repeated injections at one to two months of age and then detoxified, will show a residual tolerance and abnormalities in brain waves in response to challenge doses of morphine for months, perhaps for the rest of its life. Simply stopping the drug does not restore the nervous system of this animal to its normal, preaddictive condition. Since all studies to date have shown a close association between tolerance and physical dependence, and since the discomfort of physical dependence leads to drug-seeking activity, a persistence of physical dependence would explain why both animals and men tend to relapse to use of narcotics after detoxification. This metabolic theory of relapse obviously has different implications for treatment than the traditional theory that relapse is due to moral weakness.

LEARNED BEHAVIOR THEORY *(p. 191)*

Frederick

The conditioned drug behavior which is strengthened through reinforcement is weakened through extinction in nonreinforcement, but recovery recurs through rest. Two additional concepts are central to an understanding of learning principles inherent in drug-related behavior. A different or newly conditioned stimulus, which has not been reinforced, can evoke a conditioned act upon its initial presentation. The likelihood that this will occur increases when it is similar to a previously conditioned, already reinforced, stimulus. Thus, the process of generalization becomes important in analyzing drug-taking behavior. When two acts or responses are alike but distinguishable, the individual can be taught to respond to one and not the other. This principle of conditioned discrimination can serve as a two-edged sword in careless hands, since it can possess both addictive and therapeutic aspects. Whatever is useful to assist the drug abuser in the clinic can be used to enhance and perpetuate a new addiction out on the street, so to speak. Personality (P), motivation (M), and habit (H) factors are particularly important in bringing about a relapse to drug usage, although most values clearly will have been altered over time with continued drug use. There is a spontaneous recovery of past learned addictive habits, when the motivation or drive to abstain is no longer superior to the motivation to engage in drug usage. While most destructive and constructive factors have been altered, due to reinforcement or nonreinforcement with time, the ratio is most affected by negative personality, motivational, and habit factors. Mathematically, as the equation shows, in principle, the proportional value now approaches 1, where drug usage unequivocally develops again:

$$Ba = \frac{Pd \times Md \times Hd \times Rd}{Pc \times Mc \times Hc \times Rc} = \frac{3 \times 4 \times 3 \times 5}{4 \times 4 \times 2 \times 6} = \frac{180}{192} = 0.94$$

COGNITIVE CONTROL THEORY *(p. 8)*

Gold

Drugs exert a powerful effect on the user's thinking, feelings, and behavior. The drug abuser's whole life is dominated by drug-related activities: planning the next buy, talking about the last high, etc. With one's whole lifestyle centered around drug taking, it is not surprising that treatment is difficult and return to drug taking a frequent response to stress. The drug abuser must be drug free to benefit from treatment. Drugs are a quick and readily available temporary solution for the abuser, while treatment is slow, uneven, and difficult. To learn to cope with anxiety, the individual must experience it and not always dampen the anxiety. It is through the repeated experience of coping with anxiety that individuals learn they have control over their emotions and behavior. A comprehensive "treatment package" aimed at helping abusers develop all the skills needed, both intrapersonal and interpersonal, to cope on their own is essential for lasting change.

BAD-HABIT THEORY *(p. 12)*

Goodwin

Relapse is at least partly due to stimulus generalization, the strength of the reinforcers, and their slowness to extinguish.

EXISTENTIAL THEORY *(p. 24)*

Greaves

Relapse to drug dependency is tied intimately to my notions of what gives rise to cessation. If cessation is brought about through control of the substance or through social sanctions, relapse is virtually certain whenever such external "controls" are removed and opportunity presents itself. The individual is, after all, using the drug because it serves a need. The only individuals likely to benefit over the long haul from mere separation from their drug of dependence are those who would likely have ceased use voluntarily to begin with. This assertion is consistent with the very high rate of relapse reported following simple detoxification. The only way to lessen significantly the probability of relapse is through a socially supportive, voluntary program, such as Alcoholics Anonymous, or by treating and training people to secure the positive phenomenal states experienced by normal individuals, such as through sensitivity training, existential psychotherapy, and biofeedback.

ADAPTATIONAL THEORY *(p. 195)*

Hendin

If an individual has learned to use drugs to deal with a psychosocial crisis, he or she is liable to return to drugs when back in the same situation. We have seen young men who found heroin necessary when they were emotionally involved with women; they stopped using the drug when their relationship ended, but would return to heroin six months or a year later if they became involved with someone else (Hendin 1974a). Young women who used amphetamines to help push themselves toward academic goals or relationships with men that they thought they should have, but did not really want, would stop excessive use of the drug when out of the situation. Use would resume if they returned to an academic situation or a comparable relationship (Hendin 1974b).

Almost any prior pattern of drug abuse can be used in response to severe depression--sometimes in an attempt to remove oneself from the mood and sometimes in a more straightforward self-destructive "let the worst happen to me" mood. There of course are individuals who have been damaged so profoundly so early that life itself is a crisis from which they need to retreat. Such individuals may be free of drugs only in a restricted, protected environment.

BIOLOGICAL RHYTHM THEORY *(p. 202)*

Hochhauser

Although an individual may be able to give up drugs, subsequent feelings of "helplessness" or a later disruption of chronobiological rhythms may increase the likelihood of a relapse.

INTERACTIVE FRAMEWORK *(p. 95)*

Huba/Wingard/Bentler

Relapse into drug taking may happen in much the same way as initiation occurs, with three major dynamic exceptions. First, since the individual has previously used drugs, it is expected that there will be both a direct and an indirect effect (through behavioral pressure) of the organismic status systems on behavior. That is, there will be a craving for those drugs which have produced dependencies. In some cases, behavior may occur automatically as a result of the craving, although in most cases the indirect contribution through self-perceived behavioral pressure will occur. However, the craving may not be translated into drug-taking behavior if the psychological systems, intimate support system, or sociocultural influence system intervene through conscious deliberation, social disapproval, or sociolegal restraint. The self-perceived behavioral pressure may also be changed by product availability; cravings may diminish and disappear entirely when there is no product available for ingestion. Second, the personality system may exert more influence on relapse than it does on initiation. The individual may have developed coping and rationalization styles during prior drug use that serve to redefine intimate support, and because of strong prior behavioral tendencies, more minimal cues for rejection, loss of self-esteem, etc., may cue further drug use. Finally, environmental stress is seen to have a more vigorous role in relapse than in initiation, unless adequate counterdrug behavioral styles have been developed by the individual.

DRUG SUBCULTURES THEORY *(p. 110)*

Johnson

Return to drug use and abuse may occur if and when persons reorient themselves toward subcultural values, conduct norms, argot, and rituals, and then engage in subculture role behavior. Relapse occurs frequently because persons return to familiar patterns by participating in old peer groups and so are familiar with group roles and behaviors. For many persons, relapse may be expected since discontinuation of use may have been involuntary (incarceration, legal or family pressure to enter treatment). In a sense, such persons may never have left the drug subculture and will revert quickly to old drug-using patterns and friends upon return to the community. Levels of use may increase to abuse rapidly if the individual becomes involved in drug dealing and sales to derive an income and to obtain free drugs. Even when persons have voluntarily given up drug-using friends, regular drug use, and compliance with subcultural conduct norms, they may experience difficulty in finding new friends or in achieving new goals, thus increasing the probability of a return to drug subculture friends, values, conduct norms, and behaviors.

Drug-subculture theory does not directly incorporate the pharmacological effects of drugs in predicting relapse, but it is compatible with perspectives such as Wikler's (1953) conditioning theory, and recent theories of endorphins and drug metabolism (Verebey et al. 1978). These perspectives hold that the drugs consumed alter body and brain biochemistry and metabolism so that a person who has previously been a heavy user or was physically dependent upon a substance will exhibit physical or psychological dependence (Lindesmith 1947; Chein et al. 1964; Eddy et al. 1965) and will seek out and return to drug use as previously. While such biological-psychological factors may be important motivations in returning to drug use, drug-subculture theory holds that relapse may occur earlier and be more severe and long lasting through participation in the drug subculture than where such subcultural supports are weak or absent. Indeed, without drug subculture supports (except alcohol), especially access to illegal drug supplies via other users or dealers, persons who experience severe drug-induced craving for a particular drug might be unable to satisfy that desire. Thus, drug subcultures are critical in understanding relapse. Persons following conduct norms and role behaviors reinforce and promote pharmacologically induced craving, provide drug supplies, and structure a pattern of associations that channel biochemical and psychological desires.

SELF-DEROGATION THEORY *(p. 128)*

Kaplan

The person is likely to relapse into the deviant response pattern only in the face of erosion of personal and social support mechanisms, pervasive self-devaluing experiences, and a history of self-enhancing consequences of earlier illicit drug use.

EGO/SELF THEORY *(p. 29)*

Khantzian

In my experience, it is the tenacity, persistence, and relative immutability of the character traits and pathology in the addict that predisposes to relapse. Very often, such relapses are precipitated by experiences of rejection, loss, and stress.

I have repeatedly observed the addict's special problems in accepting dependency and actively acknowledging and pursuing goals and satisfactions related to needs and wants. The rigid character traits and alternating defenses employed by addicts are adopted against underlying needs and dependency in order to maintain a costly psychological equilibrium. Prominent defenses and traits include extreme repression, disavowal, self-sufficiency, activity, and assumption of aggressive attitudes. These defenses (and the associated character traits) are employed in the service of containing a whole range of longings and aspirations, but particularly those related to dependency and nurturance needs. It is because of massive repression of these needs that such individuals feel cut off, hollow, and empty. I suspect that the inability of addicts to acknowledge and pursue actively their needs to be admired, and to love and be loved, leaves them vulnerable to reversion to narcotic addiction on at least two counts. First of all, failing to find suitable outlets for their needs, they also fail to build up gradually a network of relationships, activities, and involvements that acts as a buffer against boredom, depression, and narcissistic withdrawal; this triad of affects acts powerfully to compel such individuals to use drugs. Furthermore, in failing to express and chance their wants and needs, they are then subject to sporadic, uneven breakthroughs of their impulses and wishes in unpredictable and inappropriate ways that are often doomed to frustration and failure. The resulting rage and anger that grow out of such disappointment also compel a reversion to drugs (Khantzian 1978).

GENERAL ADDICTION THEORY *(p. 34)*

Lindesmith

Once established, the craving persists long after the conditions that are necessary to produce it have been done away with. It may be described as a basically subconscious and irrational impulse combined with cognitive elements and with varied forms of rationalization. It is something like the craving that produces relapse in the case of other bad habits such as smoking, but it is probably much more powerful and persistent, making virtually all allegedly permanent "cures" of confirmed addiction problematic until the person dies.

Since the euphoric effects on which addicts bestow so much ecstatic praise and to which they often attribute their addiction and their relapse are maximized by episodic use and minimized by regular daily use, and since the user knows this better than anybody else, relapse is an irrational action by the addicts' own logic. They tend to conceal this irrationality from themselves with a wealth of rationalizations that, to them, seem to reflect reality and to be the "truth." They may contend that during abstinence they suffer from discomforts and disorders which make it impossible to function or to enjoy life. They may announce that they are never going to use the drug regularly again but only now and then, and then become readdicted in a few weeks. Imprisoned addicts often make such resolutions; others simply wait and look forward to the day of release when they can resume use.

Since sensitivity to the withdrawal phenomenon is greatly increased during addiction, and since the very first dose taken after a period of abstinence probably produces some mild withdrawal symptoms, the process of becoming readdicted is generally much more rapid than it was initially. It is also facilitated, of course, by association with other addicts.

COMBINATION-OF-EFFECTS THEORY *(p. 137)*

McAuliffe/Gordon

Relapse During Acute Withdrawal

Waldorf's data (1973) and our own (McAuliffe 1973) show that many street addicts report having made attempts to stop opiate use that soon end unsuccessfully during the acute phase of withdrawal. Usually, the addicts stopped for a few hours until they could tolerate withdrawal distress no longer, at which point they would go out on the street to get a shot. Relapse in such cases thus stems from a simple escape response: taking heroin to relieve withdrawal symptoms. With social support of the type found in therapeutic communities or with gradual withdrawal therapy such as methadone detoxification, relapses during the acute phase can be avoided.

We distinguish this acute phase mainly because it occupies such a prominent place in the stereotyped public conception of relapse. Taking drugs to avoid withdrawal plays a more important role in setting a lower bound frequency of use--thereby imposing a regularity on users beyond what they might prefer--than it does in relapse, because it is relatively easy to detoxify addicts and thus place them out of reach of severe withdrawal discomfort. Consequently, it is relapse after having been detoxified and perhaps abstinent for a long period--after incarceration, for example, where withdrawal sickness is not a factor--that poses the more serious practical challenge to theorists and clinicians.

Prolonged Abstinence and Relapse

For the sake of discussion it is convenient to designate a degree of relapse that embodies aspects of the phenomenon of greatest practical concern. In what follows, therefore, "relapse" will refer to the resumption of opiate use at rates sufficient to keep addiction--the strength of the drug-taking response--at a high level. Reacquisition of physical dependence is not required for relapse to apply in this sense, although reacquisition would often occur, and when it did not, the risk of its occurring would always be great. This section treats relapses in the context of prolonged abstinence and hence in situations in which impending withdrawal sickness is not a contributing factor. Relevant contingencies are considered under two headings: those stemming from psychopharmacological factors and those stemming from broader lifestyle changes.

Psychopharmacological Factors

Even when addicts successfully pass through the acute phase of physical withdrawal, they are still usually strongly addicted. Since the nondependent or detoxified addict is no longer susceptible to unconditioned withdrawal sickness, drug taking stimulated by the need to avoid withdrawal is no longer part of the response picture. Thus, in theory, prevention of relapse after acute withdrawal does not require extinction of the addict's withdrawal-avoidance response.

However, other opiate effects, especially euphoria, would still reinforce drug taking after the acute phase of withdrawal. Since cues for these effects (e.g., friends experiencing euphoria, pain or anxiety troubling the addict, and so on) are still operative in the addict's environment, the strength of the drug-taking response that is associated with them must be extinguished to complete the de-addiction process. For this extinction to occur, the addict must be exposed repeatedly to the cues that cause craving for opiates, but only under circumstances when the overall contingencies of reinforcement are so unfavorable that the addict refrains from use. An example would be an abstaining addict who when offered heroin by a friend resists his desire to use it because his wife would leave him if she noticed he was high, or because the urine sample required by his parole program would be found "dirty" (Kurland et al. 1969). Indications are that extinction takes approximately a year (Hunt et al. 1971).

Should the abstaining addict respond to craving by using opiates, the strength of the drug-taking response would again be increased. Although, as with addiction, the first reinforcement is the most dangerous incrementally, sporadic use of heroin after withdrawal does not necessarily lead to daily use (Zinberg and Jacobson 1976). However, addicts in our study report that returning to a high level of addiction is easier than acquiring it in the first place. Their observation is consistent with experiments that show that one relearns a response more easily than one learned it initially (Deese and Hulse 1967, pp. 379-380). Once acquired, a reinforcement history remains a permanent part of one's makeup, and hence ex-addicts long remain vulnerable to readdiction after they embark upon abstinence.

Substantial evidence shows that abstaining street addicts resume heroin use to obtain its euphoric effects and that desire for these effects causes relapse. Alksne et al. (1955, pp. 63, 82) found that 41 percent of 135 adolescent addicts gave euphoria as a reason for their relapsing after treatment. Stephens and Cottrell (1972, p. 51) found that "enjoyment of narcotics" was mentioned as the reason for relapsing by 49 percent of their sample of 200 addicts, and this was also the most frequent reason. We asked 47 street addicts who had been incarcerated during their addiction careers, "When you have been in jail for a long time and off drugs, so that you were not strung out, how much do you think about the following things when you think about drugs? You answer can be 'a lot,' 'a little,' or 'not at all.'" Four items were inquired about: Item 1 measured the desire for euphoria; item 2, the importance of subcultural involvement and social rewards; item 3, the use of drugs for relief of unpleasant emotions; and item 4, the use of drugs for relief of withdrawal distress. Item 1, "the high," was thought of most. Item 4, "getting rid of withdrawal sickness," was thought of least. Only 25 percent thought about withdrawal sickness "a lot," which was half the percentage (51 percent) of those thinking about euphoria "a lot"; 47 percent did not think of withdrawal at all. (For a description of this sample, see McAuliffe 1973.) Finally, experimental evidence from a study by Lasagna et al. (1955) shows that euphoria was the effect most often described by abstinent ex-addicts when they received heroin and morphine under double-blind laboratory conditions. Although only one of the 30 ex-addicts reported a pleasant reaction to placebo, 47 percent had euphoric reactions to heroin and 65 percent to morphine. Positive reinforcement of this sort would naturally increase the probability of using heroin again under similar conditions.

Thus, abstinent street addicts think a lot about opiate euphoria, most often return to using opiates for their euphoric effects, and experience euphoria when they use opiates. These facts provide a psychopharmacological basis for relapse.

Lifestyle Changes

Since we have shown that most abstaining street addicts would probably find a dose of heroin rewarding, additional factors must be proposed to explain why some addicts seek these rewards and eventually relapse whereas others do not. In the early stages of a prolonged period of abstinence it seems likely that the main environmental forces affecting the likelihood of drug use are the same as those negative ones that were originally decisive in getting the addict to stop using drugs, but as time goes on other, more positive, factors become increasingly important. Much evidence suggests that the key to remaining abstinent is successful adjustment to a conventional lifestyle while avoiding contact with the addict subculture. Personality traits, amount of education, developments in an addict's career, and pure chance events in one's social network appear to determine these lifestyle changes (Goldstein 1976a; Ray 1961; Waldorf 1970).

During the early stages of a period of abstinence many of the same forces which originally led the addict to cease drug use continue operating to prevent relapse. An addict who stopped because he was arrested may have to remain drug free to comply with the conditions of criminal probation or parole. One of our respondents reported that he remained abstinent for two years while on a parole department's urinalysis program, but three weeks after discharge from the program he started using heroin again and soon relapsed. In this case, removal of the original reason for stopping led promptly to relapse.

Abstinence from heroin use does not always represent a radical readjustment in lifestyle, for many abstaining addicts compensate by increasing their use of alcohol or other drugs, including less demanding opiate drugs such as cough medicines containing codeine, and paregoric. Drug effects of somewhat lower quality are thus achieved at less cost and risk. Waldorf (1973) found that 51 percent of his sample admitted substituting excessive use of other drugs or alcohol when stopping heroin use: 24 percent drank heavily, 13 percent used drugs to excess, and 14 percent did both. Methadone maintenance may be viewed as an institutionalized example of this substitution method of giving up heroin, and it is noteworthy that methadone programs have found that many patients also supplement their methadone with other drugs or alcohol (Bazell 1973; Bourne 1975, p. 101; McGlothlin 1977; Stephens and Weppner 1973; Weppner et al. 1972).

It is important to recognize that by substituting "less serious" drugs for heroin, addicts follow a pattern which Kandel (1975) has also found among adolescent users of many different drugs. Drug users do not regress directly to nonuse, but to lower categories of less serious illicit drugs or to legal drugs. Thus, substitution of less serious illicit drugs may be an indication of partial rehabilitation, even if it is not the desired end point of the rehabilitation process. (For a similar view, see Goldstein 1976b.)

In our view, successful reintegration into conventional society, sharing in its rewards, and avoiding the active addict peer group are essential for long-term or permanent abstinence by addicts. A number of our respondents explained that they relapsed after brief periods of abstinence because either they were unable to find a job or they became lonely after withdrawing from the addict group and finding no suitable replacement group. When addicts were successful in finding or reuniting with a wife or girlfriend and in finding a job, this success was commonly cited as a factor in promoting abstinence. Most of the addicts found that they were happy living more conventional lives and felt no need for drugs or socializing with other addicts, but there were some exceptions--addicts who said that they had always felt that something was missing from their lives when they were not using drugs. In any event, if an addict respondent lost his job or broke up with his wife, he was likely to begin associating with other addicts again. Relapse usually followed within a brief period. Stephens and Cottrell's (1972) respondents most often (31 percent) mentioned "problems with family or girlfriend" as a reason for relapse, and 23 percent mentioned "the influence of addict friends and environment." The authors determined that addicts with a job had a significantly better chance (14 percent) of remaining abstinent, although it should be noted that 81 percent did relapse.

Goldstein (1976b) has emphasized the reciprocal effects of reducing drug involvement and of social rehabilitation on each other. Since progress along either of these dimensions can easily be upset by a setback on the other, this perspective helps, along with the psychopharmacological factors of the preceding section, to account for the apparent fragility of abstinence (e.g., Ray 1961; Waldorf 1970).

Contact with active addicts in particular appears to hold great dangers for abstaining addicts even when their readjustment to conventional society has been satisfactory. One of our respondents who was abstinent for 7 months explained that he had not been associating with other addicts, but at a party he encountered an active addict who offered him a dose of methadone. The respondent claimed that he did not feel a great need for the drug and everything in his life was going well (he was working, enjoying himself, and so on), but he decided to take it anyway. As this case illustrates, it is especially difficult for an abstaining addict to resist the social pressure and temptation of an offer of a free dose, and active addicts seem prone to recruit ex-addicts back into their group.

Individual differences in adopting of the stereotypical addict lifestyle help explain the abstaining addict's subsequent readjustment to conventional society. We (McAuliffe and Gordon 1974) and other researchers (Brotman and Freedman 1968; Stimson 1973) have found that addicts vary greatly in the extent to which they embrace the stereotypical addict lifestyle. Some addicts never become strongly oriented toward heroin's pleasures; they continue to work and have a family, and they rarely commit crimes. Other research has shown that such individuals are more likely to remain abstinent once they stop using heroin than are addicts who are more like the hardcore addict stereotype (McAuliffe and Gordon 1974).

COPING THEORY *(p. 38)*

Milkman/Frosch

In addition to environmental and physical conditioning factors, drug use is difficult to extinguish because of the reinforcement achieved through recapitulation of gratifying early childhood experiences. In the case of methadone or LAAM, chemically altered ego states and peer culture are substituted for the heroin style of coping, with little direct therapeutic encounter or subsequent personality reorganization. Non-drug-oriented treatment reduces the need for drug involvement by removing the user from his or her characteristic environment, where stress may be great and drug use an accepted form of "getting over." The treatment milieu or therapist may become need gratifying (parental, structured, safe), and the addictive dependency is transferred to the surrogate experience. Therapeutic communities typically employ "forced therapy" models, temporarily adjusting the user's self-regulation system through submission to external controls. However, the underlying perception of self as victim in a hostile and threatening environment persists. Outcome studies of therapeutic community participants are not encouraging, and simple methadone detoxification has generally failed, i.e., the majority of subjects relapse before completing the customary 21- to 30-day process.

Relapse frequently occurs because contemporary treatment does not provide the user with alternative ways of defending against vulnerability and of satisfying the inner needs and wishes previously resolved through drug use. Such alternatives may include new patterns of discharge, gratification, or defense. When detoxification is initially successful, the need-gratifying therapy should be gradually discontinued through clinically monitored and graded frustrations. The user should have the necessary foundation for replicating the nondrug, alternatively gratifying experiences in his or her characteristic environment.

ACHIEVEMENT-ANXIETY THEORY *(p. 212)*

Misra

The fact that drug addiction is a form of coping with the pressures of achievement makes it highly likely that every time we confront an ex-addict with the demands of achievement, we are risking relapse. It is, then, all the more necessary to phase in a sense of responsibility for structure in helping addicts. Even then, a goal of 100 percent success in the treatment of addicts can be no more than a quixotic dream.

ADDICTIVE EXPERIENCES THEORY *(p. 142)*

Peele

Relapse will occur when dependence needs and the dependent lifestyle are not addressed when drug use ceases. Thus, certain methods of chemical treatment, such as methadone maintenance and certain therapeutic communities which eliminate drug use without addressing the underlying issues of the person's addiction, frequently produce either a temporary cure or one which is dependent on continued participation in the treatment program. When the person is reimmersed in the stresses which led to the addiction in the first place without the support of the program, addiction resumes.

Certain addictions may be dependent on a given setting or level of stress. As long as the person is not exposed to these settings, there is no danger of addiction. When these settings are exceptional, such as conditions of war or hospitalized illness, a person will not be addicted when removed from the setting. One-time life crises, such as those produced by adolescence and which are left behind when the individual "matures out," are similar occurrences. However, when the stressful situation is one encountered regularly in the person's life, then repeated bouts with addiction are likely.

SOCIAL NEUROBIOLOGICAL THEORY *(p. 286)*

Prescott

Relapse into substance abuse will occur when cognitive behavioral restructuring is achieved without concomitant changes in the neuropsychobiological mechanisms of somatosensory affectional processes. The dissociation of cognitive behaviors from psychophysiological behaviors in the processes of rehabilitation provides a basis for relapse. The establishment or reestablishment of neurointegration of somatosensory affectional processes with "higher brain centers" (altered states of consciousness) would constitute an effective barrier to relapse. If early deprivations are sufficiently severe that there is a permanent neuronal alteration of the brain, then the neuronal dendritic networks necessary for the integration of somatosensory affectional processes with "higher brain centers" would be absent and, thus, would preclude a permanent rehabilitation. Under such circumstances, continued enriched somatosensory affectional experiences would be required to prevent relapse. A useful analogy here is the diabetic's continuing need of insulin on a daily basis so that normal functioning can be maintained.

GENETIC THEORY *(p. 297)*

Schuckit

One aspect of relapse from temporary abstention or a period of apparent "controlled" use of alcohol or drugs has been discussed in the section on cessation of use. In short, the natural history of alcoholism or drug abuse appears to include periods of active abuse alternating with periods of abstinence and periods of modest use.

As is true for initiation of use in the first place, the individual who has been abstinent may return to a use pattern through the influences of both environmental and genetic factors. It is probable that social pressures which were originally important in the selection of the substance may once again exert their influence during a temporary abstinence.

An additional factor important in relapse may be an extended (i.e., up to six months or more) period of mild physical discomfort which may follow acute withdrawal from a drug (Schuckit 1979a; Johnson et al. 1970; Martin et al. 1963). During a protracted abstinence, various environmental cues may remind alcoholics or drug abusers (in almost a subliminal way) that drugs may help them to feel more comfortable (Parker and Rado 1974). There is additional evidence, however, that even in the absence of physical dependence, certain environmental cues may ther[illegible] precipitate discomfort which may be perceived by the individual a[illegible]thdrawal syndrome. This may lead to reinitiation into the use of drugs [illegible] when no strong physiological addiction had been established (Siegal [illegible]5).

Thus, it is possible that genetic factors may play a role in either the physiological drive to return to drugs as mediated by a protracted abstinence syndrome or through psychological vulnerabilities to seek the drug either to lessen peer pressure or to help alleviate a psychologically mediated discomfort. Once the individual has decided to try the drug again, genetic factors similar to those described earlier may once again be important in the transition from use to abuse.

AVAILABILITY AND PRONENESS THEORY *(p. 46)*

Smart

Relapse to drug use or addiction is common among former opiate addicts when they leave the drug-free situation and return to an environment in which availability is greater, and most addicts do best in protected nondrug-using therapeutic communities where drugs have a low availability. The best-known low-availability therapies are the therapeutic communities such as Phoenix, Daytop, Synanon, and the like. As long as addicts are in such programs they should not relapse, but difficulties should be expected when they leave them and return to high-availability situations, such as to former friends and old neighborhoods. Available research on outcomes from such programs certainly supports these expectations (Smart 1976a). On release from prison, those addicts who return to situations of high availability should also relapse, and evidence supports this assertion. In general, proneness should be less important than availability in maintaining drug use among addicts. However, after a long period of drug-free treatment or incarceration, proneness (along with availability) should again determine whether drug use is started again. Former addicts whose proneness (from whatever source) still exists may be expected to reestablish their addiction or take up a new drug with similar effects.

PERCEIVED EFFECTS THEORY *(p. 50)*

Smith

The question of relapse does not apply to the person whose substance use is occasional, noncompulsive, and regulated in such a manner that the desired effects of use continue to be perceived as outweighing the perceived undesired effects. Such a person may have periods of abstinence, but use after such a period is not truly a relapse.

The fascinating question regarding relapse is posed by the user who escalates to compulsive use, fights and wins the agonizing battle back to abstinence, but then becomes readdicted after a period of time. Many users repeat this process again and again. Why is one such experience not enough to prevent its recurrence?

One possible explanation lies in the fact that memory is highly selective, and the prior suffering may be remembered as being less intense than it actually was. Or, alternatively, the past suffering may be accurately remembered, but the recollection may not offset the desire to reexperience the pleasure of use. It is also possible that the user is driven by an unspecified biological craving that simply overpowers the fear of becoming readdicted.

Still another possibility is that the user believes he or she is now clearly aware of the warning signs that appear prior to the stage of compulsive use, will vigilantly heed any such warnings, and, in that manner, can achieve the pleasure of occasional, well-regulated, noncompulsive use without running the risk of readdiction.

Yet another possibility is that the individual's abstinent periods are themselves psychologically distressing (due to depression, anxiety, guilt, anger, etc.) and that substance use reduces those discomforts. Under such circumstances, it might be quite tempting for the user to believe that just enough substance can be taken to control those distressing mood states without returning to the level of compulsive use.

LIFE-THEME THEORY *(p. 59)*

Spotts/Shontz

What is defined as relapse depends upon what is regarded as genuine discontinuation. For how long and for what reasons must a chronic user abstain from his drug of choice before reuse is regarded as relapse? Has a person who has given up amphetamine relapsed if he continues or substitutes excessive alcohol consumption for use of his drug of choice? Does a person who gives up heroin relapse if he goes on a methadone maintenance program, or is he simply substituting one habit-forming drug for another? Does a person who stops using cocaine in prison, because he cannot afford it there, relapse if he takes it up again as soon as he is discharged? Users who are trying desperately to quit may be said to relapse every time they fail, that is, several times a week, or even several times a day.

From a theoretical point of view, relapse can occur in truly heavy usage only if the person not only gives up the use of drugs but also tries to solve the problem of individuation in a mature way. In most cases of apparent discontinuation, this probably does not happen. If someone stops taking cocaine when the supply dries up, he certainly discontinues its use. But if he starts using cocaine again when the supply is replenished, he can only be said to have relapsed if he gave up cocaine as a solution to the problem of individuation in the first place. As far as personalistic theory is concerned, discontinuation of physical consumption of a drug is a necessary but not a sufficient condition for relapse. It must be clear that something else has replaced the drug in the person's search for personal integration. Only if that something else fails and drugs then reenter the picture can true relapse be diagnosed.

FAMILY THEORY *(p. 147)*

Stanton

Most of the research and thinking about the phenomenon of "relapse" has not resulted in any satisfactory explanations. This is primarily because it has been anchored within a linear framework. On the other hand, applying a nonlinear model which accounts for cyclic behavior patterns (e.g., A leads to B leads to C leads back to A), and which encompasses homeostatic and human systems concepts, shows much greater promise. Observing a drug addict only at entry to or departure from the treatment center can provide only an inadequate picture, because it taps such a small portion of the addiction-readdiction process. This myopic and naive view of addictive patterns has led to the attributing of relapse to such nonexplanatory notions as "lack of motivation," which take no cognizance of the interpersonal (e.g., familial) pressures and triangulations impinging on the abuser and encouraging, either overtly or covertly, premature departure from treatment.

When one widens one's lens to look, for instance, at the sequence of behaviors within the abuser's family, the phenomenon of relapse fits more neatly into place. There is not space here to repeat the elements in our homeostatic model, but suffice it to say that when addicts observe that their improvement or development of greater competence results in family crises (such as parents separating or a sibling developing a problem), it only makes sense--as it would to any loyal offspring--to take up drugs again, or to show some other sign of incompetence or dysfunction. This, then, is a family addictive cycle (whether acknowledged as such by the addict or not), and efforts to bring about change in the symptom are more likely to succeed if their interventions are directed toward changing the total family process surrounding detoxification and readdiction (Stanton 1979c; Stanton et al. 1978).

It is also proposed in this model that the frequent dropouts (relapses?) seen in therapeutic communities and other types of drug programs result from crises which occur outside the program. These serve as signals to abusers to pull out. Most commonly such crises occur in the family, or certainly among people with whom abusers have relationships that are close enough and important enough to make them respond. This is perhaps the single most overlooked aspect of relapse and treatment dropout.

SELF-ESTEEM THEORY *(p. 157)*

Steffenhagen

Self-esteem theory easily accounts for relapse or recidivism. The etiological factor underlying the abuse is low self-esteem. Therefore, a social situation which causes cessation without raising self-esteem is only rehabilitative and not curative. Whenever the individual encounters an adverse social situation he or she is likely to revert to the earlier mode of coping.

Individuals who remain drug free as a result of belonging to Alcoholics Anonymous, a group-support system, will most likely return to drug abuse when the support system is lost because the group never bolsters the individual's self-esteem but only provides a form of group self-esteem.

CONDITIONING THEORY *(p. 174)*

Wikler

In 1948, Wikler proposed that relapse is due to evocation by drug-related environmental stimuli ("bad associates," neighborhoods where opioids are illegally available) of fragments of the opioid-abstinence syndrome that had become classically conditioned to such stimuli during previous episodes of addiction. As elaborated further over the years (Wikler 1961, 1965, 1973a,b,c,), this hypothesis may be stated as follows. Reinforcement of opioid self-administration is contingent upon the prior existence of "needs" (or "sources of reinforcement") which are reduced by the pharmacological effects of the drug (e.g., heroin). The processes of addiction and relapse may be divided into two successive phases, namely, "primary" and "secondary" pharmacological reinforcement. In the cases of young persons with prevailing moods of hypophoria and anxiety and with strong needs to belong to some identifiable group, self-administration of heroin is often practiced in response to the pressure of a heroin-using peer group in a social environment in which such a peer group exists. In primary pharmacological reinforcement, the pharmacological effects of heroin (miosis, respiratory depression, analgesia, etc.) are conceived as reflex responses to the receptor actions of the drug, but its "direct" reinforcing properties are ascribed to acceptance by the peer groups and reduction of hypophoria and anxiety.

With repetition of self-administration of heroin, tolerance develops rapidly to the direct pharmacological effects of the drug and physical dependence begins (demonstrable by administration of narcotic antagonists after only a few doses of morphine, heroin, or methadone; see Wikler et al. 1953). The prevailing mood of the heroin user is now predominantly dysphoric, and withholding of heroin now has as its reflex consequence the appearance of signs of heroin abstinence (mydriasis, hyperpnea, hyperalgesia, etc.), which generate a new need, experienced as abstinence distress. Because of previous reinforcement of heroin self-administration, the heroin user engages in "hustling" for opioids--i.e., seeking "connections," earning or stealing money, attempting to outwit the law--which eventually becomes self-reinforcing, though initially at least, it is maintained by acquiring heroin for self-administration. In this stage, the "indirect" reinforcing properties of heroin are attributed to its efficacy in suppressing abstinence distress. "On the street," the heroin user who is both tolerant and physically dependent frequently undergoes abstinence phenomena before he is able to obtain and self-administer the next dose. Given certain more or less constant exteroceptive stimuli (street associates, neighborhood characteristics, "strung out" addicts or leaders, "dope" talk) that are temporally contiguous with such episodes, the cycle of heroin abstinence and its termination can become classically conditioned to such stimuli, while heroin-seeking behavior is operantly conditioned. Sooner or later, the heroin user is detoxified, either in a hospital or in a jail.

The well-known "acute" heroin-abstinence syndrome which is of relatively short duration (about two to four weeks) is followed by the "protracted" abstinence syndrome which, in the case of morphine addiction, has been found to last about 30 weeks (Martin 1972). At least during this period, the detoxified heroin user may be said to have still another new need. If, then, he is returned to his home environment, he is exposed to the phase of secondary pharmacological reinforcement. In response to the conditioned exteroceptive stimuli already described, he may exhibit transient conditioned abstinence changes, experienced as yet another new need, namely "narcotic hunger" or "craving." Previously reinforced "hustling" is also likely to appear now as a conditioned response (self-reinforcing) to these same exteroceptive stimuli and lead to acquisition and self-administration of the drug with reestablishment of physical dependence as in the "indirect" stage of primary pharmacological reinforcement, and the cycle of renewed conditioning, detoxification, and secondary pharmacological reinforcement with relapse is repeated again. Also, in the phase of primary pharmacological reinforcement, certain of the interoceptive actions of opioids, not involved in the suppression of abstinence phenomena, can acquire conditioned properties, inasmuch as in a tolerant and physically dependent individual, they are often followed by conditioned abstinence phenomena, conditioned abstinence distress, and conditioned hustling leading to self-administration of heroin (relapse). Other interoceptive events can likewise acquire the property of evoking conditioned self-administration of opioids. For example, anxiety is frequently associated with the opioid-abstinence syndrome, and probably the two phenomena are mediated, in part, by the same central nervous system pathways. Hence, the occurrence of anxiety for whatever reason long after detoxification may result in relapse.

ROLE THEORY *(p. 225)*

Winick

The reasons for relapse, in terms of this theory, would reflect the person's inability to sustain the role of the nonuser. Each period of abstinence may represent a trying out of the nonuser's role, for varying periods of time. It is likely that the most common pattern of cessation of drug dependence involves experimentation with the nonuser's role until it is consonant with other aspects of the person's life.

An earlier formulation of the theory argued that drug-dependent persons "matured out" when there was a lessening of the role pressures which had led to the beginning of regular drug use (Winick 1962a). The process of "maturing out" was slow and typically involved a stop-start pattern of drug use until the person felt comfortable with the role of the nonuser.

In the original study which led to the formulation of the "maturing out" theory, based on a national sample, the mean age of "maturing out" was 35 (Winick 1962a). The narrow clustering of age at "maturing out" in different samples at different times suggests that there are underlying regularities in the process. Ethnicity, sex, residence, access to and salience of drugs, attitudes toward drugs in an area, and the extent to which nondrug-related roles are plausible and reinforced, contribute to cessation of drug use, as does the extent to which the user experiences less role strain and/or deprivation.

DEFENSE-STRUCTURE THEORY *(p. 71)*

Wurmser

Since the underlying conflicts usually are not resolved, and the propensity to affect regression and ensuing defense by denial remains, any new, usually inevitably recurring disturbance of the narcissistic equilibrium gets the specific circular process of drug use once more into motion. Quite often one can find a displacement from the drug-withdrawal-related discomfort onto all distress. The process is this: When I was anxious (etc.), drugs relieved the otherwise unmanageable feelings. When the drugs ceased their effectiveness (e.g., in acute withdrawal), all the suppressed feelings came back, usually with increased vehemence, and coupled with all the added unpleasantness of withdrawal. Now, whenever I feel intense affective distress I also feel the typical withdrawal symptoms. Such microconversion symptoms based on displacement (from anxiety, shame, etc., onto physical symptoms once accompanying their resurgence) in form of chills, diarrhea, the "yen," etc., weeks or years after detoxification from physical addiction, can be observed in many compulsive drug users. The drug is seen as a specific relief for both: affective distress and the conversion symptoms in the form of pseudowithdrawal.

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